HE ENGINEERING CONSTRUCTION WEEKLY

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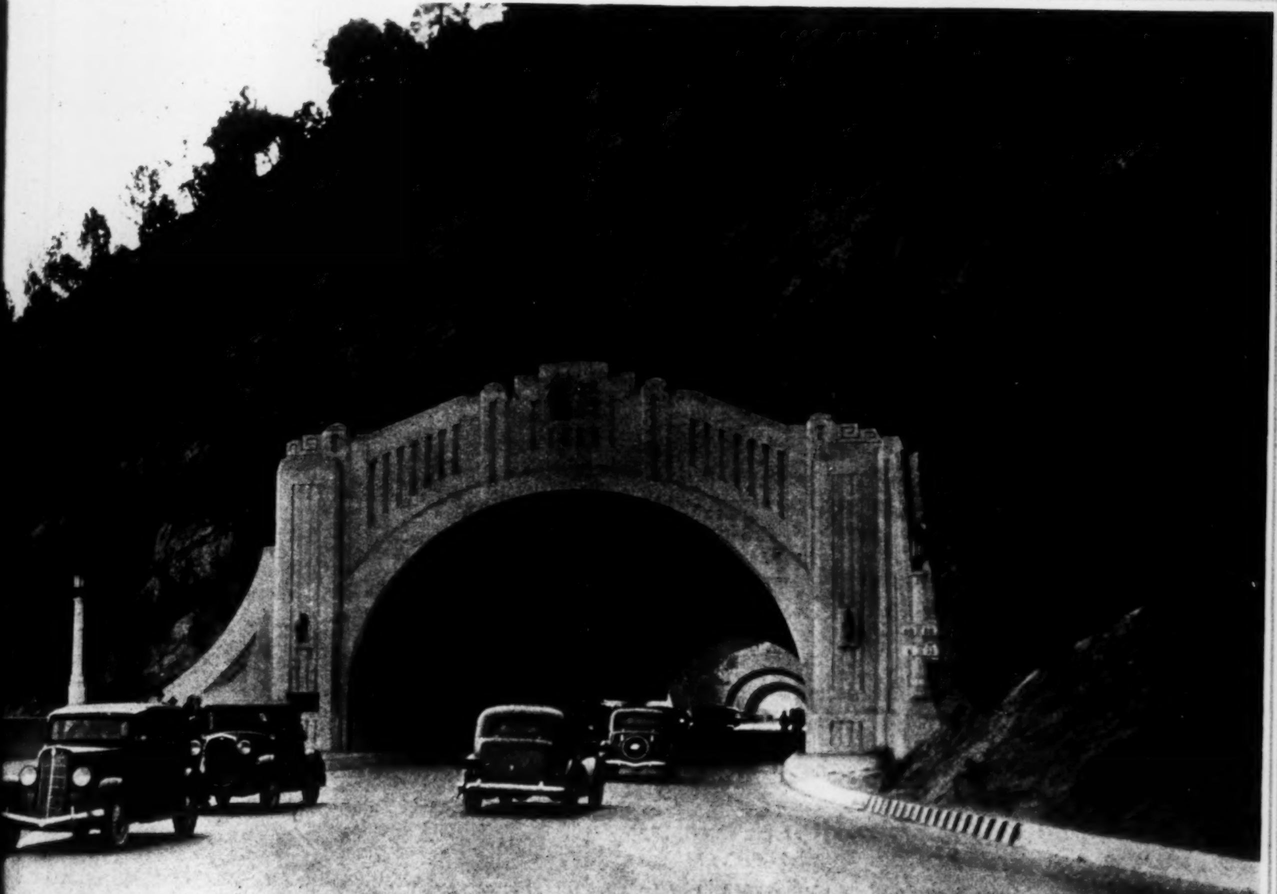

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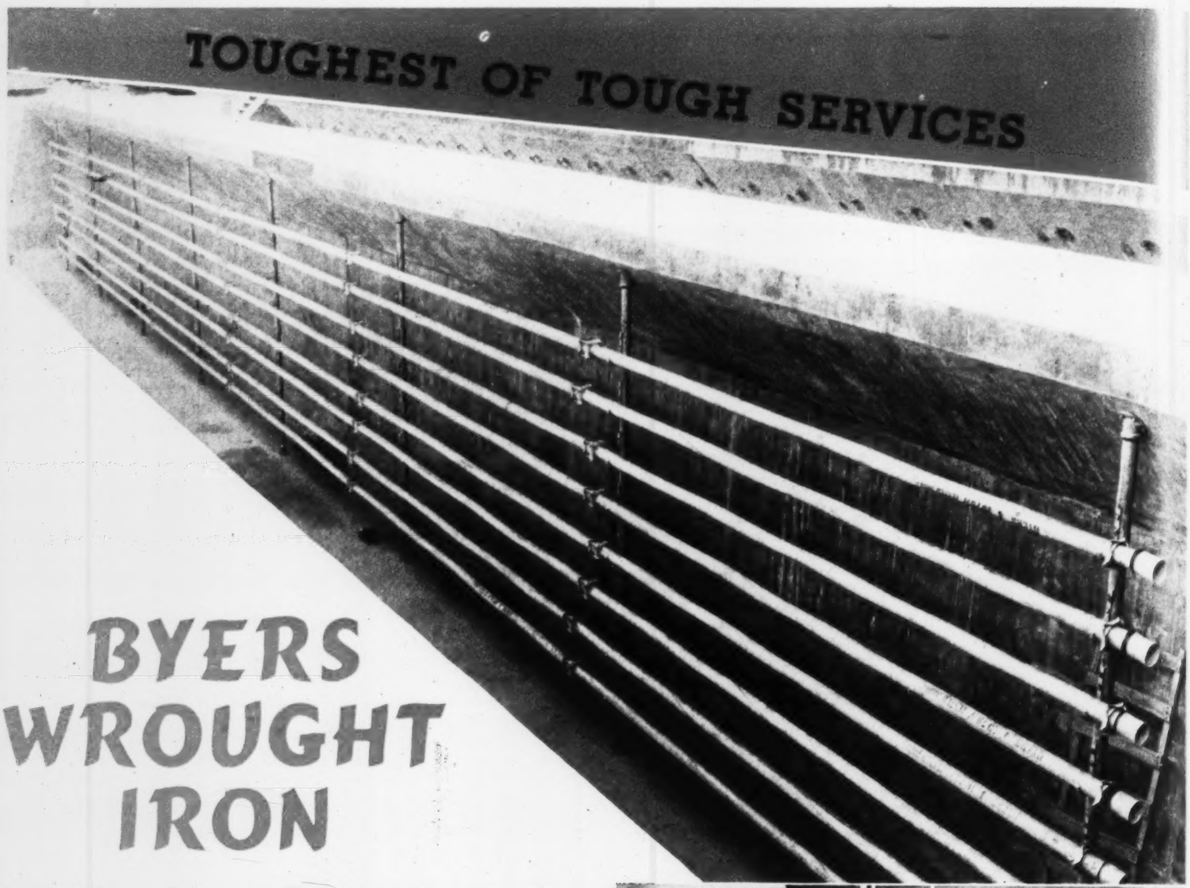


TOUGHEST OF TOUGH SERVICES

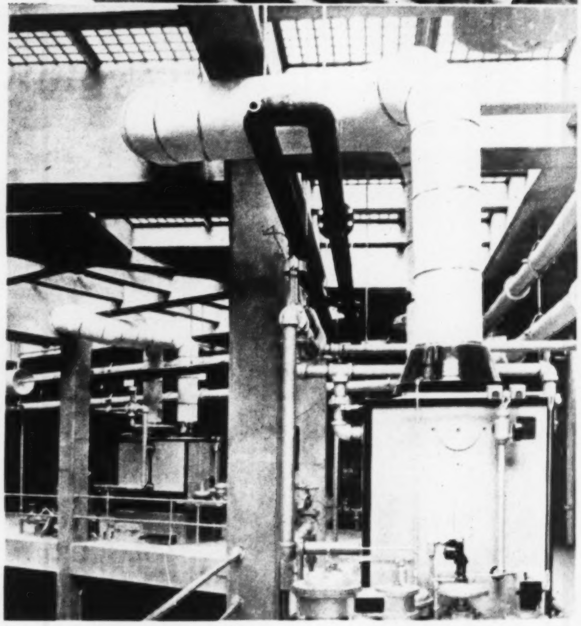
BYERS WROUGHT IRON

for Sewage Treatment

● Cleveland again makes a wise investment of public funds by choosing low-cost-per-year material for the tough service of sewage treatment. Illustrated is the Southerly Sewage Treatment Plant, where Byers Wrought Iron was used for one of the toughest of the tough services, namely: the gas engine jacket water cooling coils suspended in the aeration tanks where corrosion from the sewage is severe.

This is typical of the corrosive jobs for which many leading engineers are specifying wrought iron. Hot circulating water on the inside of this pipe is corrosive—BUT with the heat, the sulphides, nitrates, chlorides, phosphates and carbonates—both gaseous and liquid—would make short life of ordinary ferrous metals. Records show that wrought iron lasts longer and costs less per year in this kind of corrosive service.

Let us review with you the actual service data and illustrations accumulated by our field engineers from many of the country's important sewage treatment plants, where Byers Wrought Iron is on duty. Some of this technical information is in the illustrated booklet "Wrought Iron in Sanitary Systems"—a copy of which may be obtained from our nearest Division Office or our Engineering Service Department in Pittsburgh. A. M. Byers Company. Established 1864. Pittsburgh, Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Seattle, San Francisco.



BYERS
GENUINE
WROUGHT IRON
Tubular and Flat Rolled Products

Specify Byers Genuine Wrought Iron Pipe for corrosive services and Byers Steel Pipe for your other requirements

· THE PUBLISHERS' PAGE ·

Just a Way Station

THIS IS THE SEASON when business is accustomed to pause and take stock of "the year", i.e. the year just past and the year ahead. Just why it should do that, except as a matter of custom, is not clear. There seems to be no good reason why the affairs of men should follow the cycle of the calendar; it is possible, indeed, that calendar-mindedness tends to aggravate our economic disorders.

When men lived chiefly by agriculture, their economic affairs were regulated by the parade of the seasons. The cycle from sowing to harvest was contingent on the period of the earth's circuit around the sun. The year was a logical span by which to measure needs and order productive activity.

But with the rise of other forms of production, that natural cycle has become less important in appraising economic trends. The harvest of an industrial economy is not a matter of the seasons. The capital that is sown today in new facilities and equipment may not come to fruition within a twelvemonth; our investment in the design, production or marketing of a new product cannot be expected to return a harvest within so brief a period. The cycle of industrial production may be one of three, five, ten or twenty years, depending on many factors; it is not related to the earth's movement about the sun or to the year that measures that movement.

ONE of the handicaps under which industry labors is this subconscious acceptance of the year as an interval by which to measure performance. It affects the relations between management and its stockholders, employers and employees, bankers and debtors, government and taxpayers and every other relationship involved in our economy. The showing of the *annual* statement becomes our chief god; and to its worship many very real values may be sacrificed.

Some day, perhaps, we shall outgrow it. Already, in the programs, commitments and appropriations of some companies, we see a trend toward thinking in other terms. Research, development, advertising and plant expansion programs are being based on longer terms to provide a more rational cycle for business performance. It is necessary, of course, that every business keep control records in which the year, like the month or the week, is just another unit. But it is one thing thus to use the year as a unit of time, and another to establish it as a standard of accomplishment.

So what?

Well, we now are entering another of those "new years." According to the conventional view, we have had a "good year." But at the moment we happen to be passing through a period of adjustment which overlaps the end of one year and the opening of another. Because of that we are in danger of losing our perspective and of discounting both the achievement of the old year and the promise of the new. And what we discount in our minds today, business may well be discounting on its books tomorrow.

SO it looks as though this would be a good time not to dwell too heavily on this "turn of the year" idea. Let us leave the "turning of the year" to the calendar, where it belongs. So far as business and its planning are concerned, let us rather keep our sights trained on the fact that we still are only part way back on a recovery swing. We already have made most of the adjustments that were indicated by the current recession. As a nation we still have to make up vast shortages of everything worth having. There isn't a single material or financial factor that threatens to reverse the trend of the recovery cycle. And there is every indication that any psychological barriers to continued progress are now being levelled.

All this is a trend that is not of 1937 or 1938. It is not a matter of "a good year" or "a bad year." It is a matter of the long-term business cycle, which means far more to modern industry than the passing of a calendar year. That is just a way station.

Willard Chevalier

ENGINEERING NEWS-RECORD

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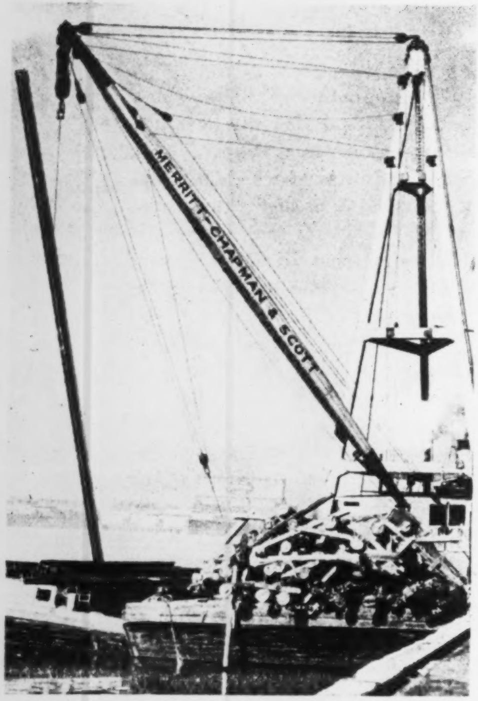
Over 2 Million

Since January 1935, more than 2,841,200 feet of U·S·S Steel Bearing Piles have been driven in 194 projects



FAY, SPOFFORD & THORNDIKE *and the Massachusetts Dept. of Public Works designed an interesting construction using clusters of USS Steel Bearing Piles capped with steel-and-concrete cylinders to replace damaged wooden piles under Boston's immense Commonwealth Pier. In this photograph you see how easily the contractors, Merritt, Chapman & Scott, handled the longest single length bearing pile ever driven, 128′6″ long.*

LESS DISPLACEMENT *and disruption of the soil is an important advantage of USS Steel Bearing Piles. It explains the easy penetration and close spacing possible. The high moment of inertia provides the high rigidity and high load-carrying capacity.*

FOR more than forty years various combinations of steel sections have been used as bearing piles with entire satisfaction.

But within the last three years there has been an especially rapid increase in the use of steel bearing piles. This trend has been accelerated by the important disclosure that steel pile sections buried twenty-five years show practically no deterioration . . . and by the introduction of the more efficient wide-flange CBP section — USS Steel Bearing Piles.

These new bearing piles have been driven in a wide variety of projects. Large jobs and small jobs. Fresh water and salt water. Under buildings, bridges, viaducts, dams and docks. The longest single length pile ever driven (128′6″) is a USS Steel Bearing Pile in the new foundation of Boston's immense Commonwealth Pier.

USS Steel Bearing Piles offer many advantages. They can support unusually heavy loads per pile. They can carry high bending stresses. They can act as columns of trestle bents. They effectively resist lateral displacement. They penetrate with remarkable ease through all types of sub-strata soil—deep alluvial deposits, tough shales, hard clays, coarse gravels, debris, old timbers, etc. They make possible the reconstruction of bridges and trestles in place, without interruption to traffic.

In general, USS Steel Bearing Piles offer higher bearing capacities — and they are more easily handled and driven — than any other form of bearing pile available.

U·S·S STEEL BEARING PILES

CARNEGIE-ILLINOIS STEEL CORPORATION
Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Products Company, New York, *Export Distributors*

UNITED STATES

· ENGINEERING NEWS-RECORD ·

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Vol. 119 *DECEMBER 30, 1937* No. 27

THIS WEEK AND NEXT

STEEL PIPE PILE-DRIVING on New York's West Side Highway exercised the contractors' ingenuity in developing new driving machines. What is believed to be a record in total footage on one job was established, with 130 miles of piles being driven.

First the heavy demands of the San Francisco exposition, then the reduced requirements of Yerba Buena Island must be met by a new water supply system. Economical provision for these two extremes is described on page 1050.

Modernizing pavements in Indiana has proven a job more complex than new construction. Some problems and their solutions are presented.

Salvage from Sewage may sound speculative. After reading the article on p. 1055, however, in which is listed the number of by-products already recovered and used, it will be apparent that the future may bring a large increase in the conservation of other valuable compounds that now are wasted. (It was erroneously stated last week that this article is based on an A.P.H.A. report.)

New York law requires the use of dust control devices on all rock drilling to prevent silicosis. Sixth Ave. subway contractors don't like the approved vacuum hood systems, so have developed a system combining wet drilling with special valve drifters and face ventilation.

Louis J. Sack comes forth with some convenient means for finding the volumes of intersections of cylinders in various relations to each other.

GROUTING under Pine View Dam will be the subject of an article in next week's issue.

The annual Highway Number will be published January 13. Don't forget the Road Show January 17-21 at Cleveland.

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The Cover Picture is of the North entrance to the Figueroa Tunnel through ridges of Elysian Park in Los Angeles. It was a short distance to the right of this tunnel that the recent Elysian Park slide occurred.

[illegible]

Number of copies of this issue printed: 32,126

HEAVY LOADS

won't break an ARMCO SEWER

The satisfactory performance of an older Armco line led to the selection of Asbestos Bonded Armco pipe for this recent installation at Rochester, Minnesota.

● No matter what else may happen to an Armco sewer, heavy loads will not break it. Tree roots will not reduce its efficiency. And soft foundations will not separate the individual sections.

These common ailments, which account for the majority of all sewer failures, are *definitely overcome* in the design of Asbestos Bonded Armco sewer pipe. Its strength and flexibility are proved by 41 years of successful experience.

To these superior *structural* qualities, Armco has added a high degree of *material* permanence. First: by using a galvanized, rust-resisting iron with a 30-year service record. Second: by reinforcing the pipe in the bottom where the wear is hardest. And third: by "bonding" a special bituminous coating to the finished pipe. Address: Armco Culvert Mfrs. Assn., Middletown, Ohio.

ARMCO

ASBESTOS BONDED
ARMCO SEWER PIPE

A PRODUCT ORIGINATED AND DEVELOPED BY ARMCO ENGINEERS

· ENGINEERING NEWS-RECORD ·
DECEMBER 30, 1937

THE WEEK'S EVENTS

President Reiterates Plea for Road Cut

Letter to Cartwright says it will reduce unemployment less than other budget cuts

Answering a letter from Representative Cartwright, Chairman of the House Roads Committee, in which strong opposition was expressed to the proposed cut in expenditures for federal aid to highways (*ENR*, Dec. 2, 1937, p. 877), President Roosevelt repeated his recommendation that the cut be carried through. The President said that if the budget was to be brought into balance, cuts must be made somewhere, and that if Congress did not wish to cut highway funds, it must find some other place to reduce expenditures.

The President said that he felt that the reduction should be made in highway expenditures rather than elsewhere because highway expenditures were considerably above pre-depression levels and also because expenditures on federal aid highways created less employment than other types of federal expenditures.

Text of letter

The President's letter follows in part:

". . . If we had all the money in the world to spend, I would gladly go ahead with road building in every county in the United States on an even greater scale than we are doing at the present time.

"But there are two factors which I know you will consider:

"The administration is making an earnest effort to cut the budget down to a figure which will closely approximate the estimated tax receipts. That means that we ought to cut off appropriations which may be desirable but which are not essential.

". . . As you know, up to 1929, the average amount of federal aid to road building in the United States was less than $100,000,000 a year, and now under authorization and appropriation it will run to between $200,000,000 and $300,000,000.

"Also, as you doubtless know, money spent on federal aid highways takes very few people directly off the relief rolls. It is true that many of the contractors' regular forces are kept at work and some people are put to work making cement, steel binder, and other materials. Nevertheless the fact remains that federal aid highways give relatively little help to the several million Americans who are actually in pressing need. Local farm to market roads give a far higher percentage of relief employment than the federal aid roads.

"Therefore, . . . if I have to get the budget down to a certain figure, obviously, I must eliminate the proposed expenditure which provides the least work and favor those expenditures which give the most work.

". . . If the Congress decides to keep on spending between two and three hundred million dollars a year, on federal aid highways, the Congress can, in its wisdom, reduce other appropriations to make up the difference. . ."

Cofferdam Collapse Kills Eight

Collapse of a cofferdam 29 ft. high and inclosing an area of 65 ft. by 50 ft. at Port Stanley, Ont., resulted in the death of at least eight men and possibly of others. The dam had been erected to unwater the foundations for a trunnion pier of a new lift bridge being built over Kettle Creek as a federal relief project. The dam failed very suddenly with not more than a few seconds warning before the water rushed in on the men trapped in the unwatered area.

Excavation of the foundation site had been nearly completed at the time of the failure, and it had been planned to begin concreting work in a few days. The cause of the failure has not been established, but an investigation is in progress.

Work has been under way on the foundations of the Kettle Creek bridge since last summer. It is being built by the Birmingham Construction Co. of Kingston under a $250,000 contract.

WPA Project Planned At Grand Coulee

Plans announced to clear reservoir area as a $9,000,000 WPA project

What, if carried out, is believed will be the largest project ever undertaken by the WPA is the clearing of the reservoir of Grand Coulee Dam. Washington State WPA Director Abel is now preparing plans for the project, which would require a federal appropriation of more than $9,000,000.

Three thousand men would be employed for three years on the project, which will cover an area from the dam to the Canadian border, a distance of 150 miles. More than 28,000 acres of land will be cleared for the reservoir site. The project would involve removal of 250 miles of fencing, 100 miles of telephone lines, 25 miles of telegraph lines, 1,200 buildings, and three cemeteries, and relocating 27 miles of state highway, 68 miles of county highway and 25 miles of railway tracks.

The Interior Construction Co., which made the low bid Dec. 10 for raising Grand Coulee Dam to its ultimate height, have organized with the following general officers: T. J. Walsh, chairman of the board; Henry J. Kaiser, president; Guy F. Atkinson and Chas. A. Shea, vice-presidents; Felix Kahn, treasurer; Guy F. Atkinson, secretary; Paul L. Wattis, assistant secretary. On the job the officials will be Edgar F. Kaiser, resident vice-president and general manager; J. F. Reis, auditor and assistant treasurer; Roy E. Dycus, assistant auditor and Clay Bedford, general superintendent.

The Interior Construction Company was formed with 50 per cent of the control held by the M.W.A.K. Co., contractors on the work now being done at Grand Coulee, and 50 per cent by incoming interests new to the job. New stockholders are as follows: Thompson-Starrett Co., Inc., New York; Henry J. Kaiser Co., Oakland; McDonald & Kahn Co., Ltd., San Francisco; Utah Construction Co., Ogden; Morrison-Knudsen Co., Inc., Boise, Idaho; J. F. Shea Co., Inc., Portland, Ore.; General Construction Co., Seattle, Wash., and the Pacific Bridge Co., Portland.

Authenticated News Photo

GERMANS PLAN BIG AIRPORT

THIS MODEL shows how the Tempelhof Airport in Berlin will look when completed. It will be one of the largest airports in the world. A view of the airport during construction was published June 24, page 965.

Early Call for Bids On Shasta Tunnel

Recently announced plans for building a bypass railroad tunnel beneath the west abutment of Shasta Dam on the Central Valley project have advanced to a point where advertisement for bids on the tunnel is expected in January. This plan will permit calling for bids on the dam itself probably in March 1938.

The bypass tunnel will be for a single track railroad, will be lined with concrete for its entire length of 1,592 ft. and will require between 30,000 and 40,000 cu. yd. of excavation in approach cuts. The total length of the bypass including the tunnel will be about 3,000 ft.

In addition to serving the railroad during construction of the dam it is possible that later, when the railroad is using the relocated line the tunnel may be used to bypass the flow of the Sacramento River prior to final closure. The tunnel ultimately will be closed with a concrete plug beneath the upstream edge of the dam. Thereafter, the lower part of the tunnel below the plug will serve as an outlet tunnel used by steel penstock lines leading from intake gates to the power house on the right bank of the stream below the dam. Where the tunnel passes under the dam there will be 60 ft. of solid rock (a meta andesite) between the tunnel arch and the nearest concrete work in the dam structure.

Decision of the Bureau of Reclamation to establish a high water level in the reservoir 30 ft. below that originally intended has made it possible to relocate the new railroad line to better advantage in the 11 miles south of O'Brien Summit (El. 1,224) which is the high point on the 30 miles of new line that is to replace the 37-mi. main line now in the Sacramento River canyon. However, because lowering the water level does not affect control points at O'Brien summit and at the north end of the Pit River Bridge (because the maximum gradient is used between these two points) much of the 30-mi. relocation is not effected by changing the high-water line. One effect, however, will be the use of a 0.4 per cent grade on the high Pit River Bridge thus beginning to take advantage of the newly established level at a point immediately south of one of the control points.

• • •

Prof. Ross F. Tucker Dies

Ross F. Tucker, professor of building and construction engineering at Massachusetts Institute of Technology, died at Cambridge on Dec. 26, in his 69th year.

Prof. Tucker was born in Sacramento, Calif., and graduated from M. I. T. in 1892. After a short period with the Ransome & Smith Co. he participated in the organization of the Aberthaw Co., Boston, specialists in the then developing art of reinforced concrete construction. Five years later Mr. Tucker became a member of the firm of Tucker & Vinton, which took contracts for the installation of steel and concrete vault lighting in the stations of the New York subway and for other reinforced-concrete work on that project.

Subsequently Mr. Tucker became active in the development of the Building Trades Employers Association at New York, being particularly interested in arbitration of labor disputes. In 1926 he was called to M. I. T. to organize and head the department of building engineering.

Colorado-Big Thompson Project Approved

President Roosevelt on Dec. 28 approved the start of construction on the $44,000,000 Colorado-Big Thompson irrigation and power project in Colorado, which will divert 310,000 acre-feet of water from the Colorado River through a 13-mile tunnel under the continental divide to provide a supplementary water supply for lands on the eastern slope. An appropriation of $900,000 for the project was approved by Congress in August, 1937.

Besides the tunnel and canal system, the project comprises two pumping plants and an initial installation of 30,000 kw. of hydroelectric generating capacity which will eventually be increased to 142,500 kw. Excess power above the 18,000 kw. the pumping plants demand will be available for distribution to the public.

The estimated cost chargeable to irrigation is $24,666,079; that to power is initially $7,036,693, which will be increased to $19,083,243 with full development of the five additional high-speed generating stations.

• • •

Chicago Appropriates For Filtration

Appropriations from the sale of $4,545,000 water certificates are made by the Chicago City Council in its 1938 budget for a start on the proposed $20,000,000 South Side filtration plant. To increase the distribution capacity a $1,650,000 appropriation is made to start work on a $13,500,000 system of deep rock tunnels on the South Side from a point in 67th St. near the 68th St. pumping station to Western Ave. and 57th Sts.

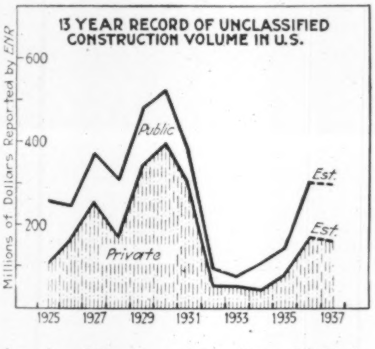
THE CURRENT TREND

This week's news of contract volume and construction cost factors

Unclassified Volume Nears 1936 Mark

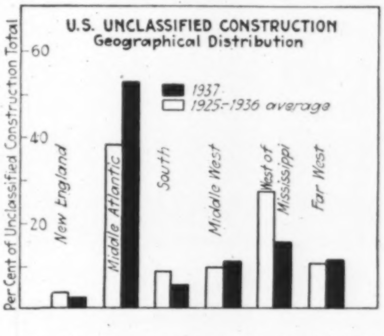
Middle Atlantic, Middle West and Far West 1937 Volume above 12-year average

Tunnels, subways, electrical distribution systems, airports, pipelines and miscellaneous construction, reported by *Engineering News-Record* under unclassified construction, totals $294,770,000 for the 51 weeks of 1937. It is 2 per cent above the volume for the corresponding period in 1936. The 1937 unclassified total exceeds the yearly volume of the years 1932 through 1935, and at its current rate should almost equal the 1936 volume, $300,148,000. The record year for unclassified construction is 1930 with a $522,563,000 volume, and the lowest depression year is 1933 with $76,331,000, the lowest since 1921. The average yearly total for the 12 years preceding 1937 is $275,669,000.



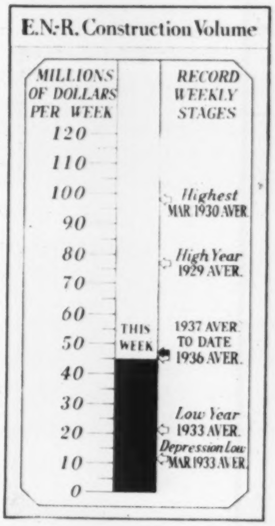
Unclassified construction awards for 51 weeks of 1937 are 12.3 per cent of the total engineering awards reported by *ENR*. In the 12 years preceding 1937 these awards range from the high of 16.6 per cent of the total construction in 1930, to the low of 7.1 per cent in 1933. Unclassified construction averages 11.2 per cent of construction reported by *ENR* over the 12-year period.

Private unclassified construction for 1937, $160,197,000, is 54.5 per cent of the unclassified total. Private volume in this classification averages 65.2 per cent of the total for the past 12 years, reaching the high of 77.8 per cent in 1931, and the low of 42.5 per cent in 1934.



In the 51 weeks of 1937 the Middle Atlantic states account for 53.2 per cent of the unclassified volume. Large contracts for the Lincoln Tunnel and the Sixth Avenue Subway in New York City, and the Pennsylvania Railroad electrification program in eastern Pennsylvania are responsible for the large volume in this section. West of Mississippi accounts for 16.1 per cent of the 1937 total; Far West, 11.8 per cent; Middle West, 11.3 per cent; South, 5.3 per cent; New England, 2.3 per cent.

In the 12 years preceding 1937 the Middle Atlantic states also are in the van, averaging 38.6 per cent of the unclassified total. West of Mississippi, during the same period averages 27.6 per cent; Far West, 11.0 per cent; Middle West, 10.0 per cent; South, 9.2 per cent; New England, 3.6 per cent.



THIS WEEK'S FIGURES

(Tousands of Dollars)

CONTRACTS

	Week Ending Dec. 31 1936	Week Ending Dec. 23 1937	Week Ending Dec. 30 1937
Federal	$1,425	$9,112	$3,359
State & Municipal	24,400	20,180	21,936
Total public	$25,825	$29,292	$25,295
Total private	17,195	15,493	19,694
TOTALS	$43,020	$44,785	$44,989

Cumulative
1937 (52 weeks) $2,437,623
1936 (53 weeks) $2,386,845

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works $25,000; industrial buildings, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1936 53 Wks.	Cumulative 1937 52 Wks.
NON-FEDERAL	$948,380	$1,455,950
State & mun. bonds	506,006	530,902
Corporate securities	251,516	516,983
PWA loans, grants	165,860	178,126
RFC loans	24,998	29,939
Fed. aid for highways	....	200,000
FEDERAL	$691,237	$746,223
TOTAL CAPITAL	$1,639,617	$2,202,173

ENR INDEX VALUES

Index Base	1913	1926
Construction Cost (Dec.)	244.95	117.75
Construction Volume (Nov.)	146	64

THIS WEEK'S LARGE CONTRACTS

Steel rails, Northern Pacific Railroad, Chicago, Ill. est.	$8,925,000
Apartment, C. F. MacEvoy, Newark, N. J.	1,500,000
Residential development, Garden Bay Manor, Inc., Woodside, N. Y.	1,000,000
Residential development, Garden Bay Manor, Inc., Jackson Heights, N. Y.	840,000
Buildings, Gallatin County Hospital Authority, Shawneetown, Ill.	1,295,000
Concrete sidewalks, St. Louis, Mo.	1,935,000
High school, Chicago, Ill.	661,000
Highways, California	942,000
Highways, Mississippi	796,000
Excavating, Barge Canal between Lock 8 and 101, Cranesville, N. Y.	843,000
Steel rails, Western Pacific Railroad, San Francisco, Calif. est.	913,000
Constructing Ayers Beech and Johnson Parks, Highland Park, N. J.	652,000
Improvements in city parks, St. Louis, Mo.	579,000

Union Holds Meeting on Unemployment

Delegates to F.A.E.C.T. convention report increased unemployment among technical men

A serious unemployment situation among technical men arising from the present business depression was canvassed at an extraordinary conference called Dec. 19 in New York City by the Federation of Architects, Engineers, Chemists and Technicians, C.I.O., and plans were formulated to meet the situation.

Extent of the unemployment situation was revealed in reports of the delegates to the conference. Chicago delegates reported layoffs of 99 per cent of the technical staff of U. S. Gypsum, 95 per cent at Austin Co., 33 per cent at Roberts & Schaefer, and layoff of the entire staff at Reynolds Engineering in Moline, Ill.

Layoffs in Detroit

Detroit delegates pointed to an 80 per cent layoff at Kelsey-Hayes and drastic cuts in structural and engineering design fields, while in Philadelphia General Electric & Westinghouse have been drastically affected.

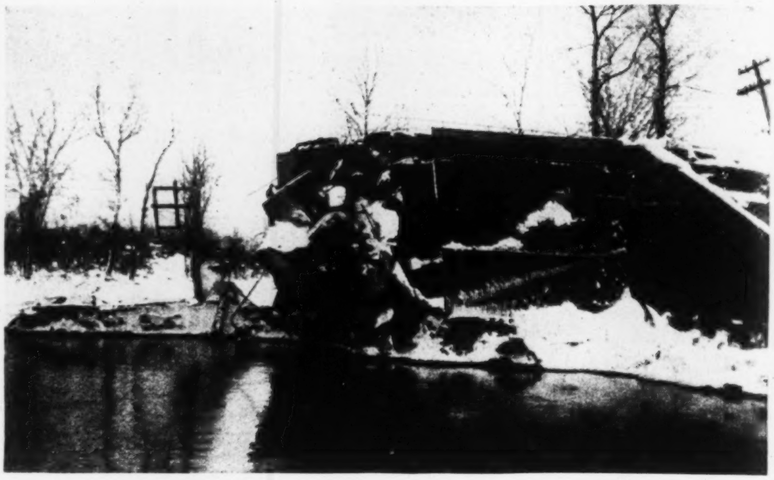
New York representatives at the conference referred to Gibbs & Hill, Electric Bond & Share, Austin Co., and Mergenthaler, as typical of large corporations making drastic cuts in their technical personnel within the last few months.

At Charleston, W. Va., 125 of the 200 technical men employed by Carbide Carbon Chemical Co. were laid off within the last month, it was reported. In all these cases, delegates emphasized the sudden and drastic nature of the layoff.

Action proposed

To meet the situation presented by this increase in unemployment, the conference instructed its chapters to set up unemployment committees to help place unemployed technicians. A resolution was passed endorsing the plan for a $5,000,000,000 housing program which was proposed at the recent convention of the Steel Workers Organizing Committee. A committee was elected to help draft legislation which would utilize money accumulating in the Social Security fund for housing purposes.

President Lew Berne announced that the federation had increased its membership to 7,500 since the national convention in October and that it is now launching a membership drive in federal civil service and the steel and electrical industries.



WRECKAGE OF PAW PAW POWER PLANT

FAILURE of the Paw Paw, Mich., dam and power plant, Dec. 8 (*ENR* Dec. 16, 1937, p. 967) is believed to have been due to water breaking through the sand foundation on which the dam stood, creating a hole into which the power plant and spillway fell. The Paw Paw plant consists of a concrete dam and spillway creating two lakes of 210 and 70 acres respectively and a 140-kw. generating plant. The system is about 30 years old.

At the time of the failure, which occurred early in the morning, the plant had been shut down, power being supplied from an auxiliary source, and no one was in charge. First warning of the failure came when breakage of the power circuit put out the lights in the city.

Both lakes were dry within an hour, and in going out the water took out about 100 ft. of main highway and a culvert as well as the main line sewer to the city disposal plant. Power house, spillway, one water wheel, the generators, and the switchboard completely disappeared and were found by sounding to be buried about 15 ft. below tail-water level, covered with sand.

The above view shows the east end of the dam at the right. The buried structures lie in the pool at the left.

Low Cost House Developed By Forest Service

A frameless wooden house which can be built for a cost of $2,000 to $3,000 has been developed after about two years of investigation by the Forest Products Laboratory of the U. S. Forest Service and is now undergoing final test. The house is built of prefabricated plywood panels made by gluing sheets of plywood to both sides of a light interior framework. The panels will be room-size wall, floor, and roof sections 4 ft. wide, designed on the stressed-covering principle under which the plywood carries some part of the load.

A phenolic-resin-bonded plywood is used in the panels. Wall panels are 3 in. in thickness and packed with insulation. Floor panels are 6 in. thick. Special barriers prevent accumulation of moisture within the exterior walls, and a high degree of fire resistance has been achieved.

Windows and doors are built into panels so that they can be located where desired. Electrical and plumbing lines are incorporated in the panels and connections are made at the time the panels are being put together.

This type of prefabricated wooden house can be put up in a few days, according to George W. Trayer, chief of the Division of Forest Products Research. The house can have one or two stories, a flat or pitched roof, and may be set over a cellar or on another foundation.

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Long Bridge Opened In India

The King George VI railway bridge over the Meghna River in eastern Bengal was opened early this month. The bridge received its name because it is the largest bridge to be completed in the British Empire during coronation year. It consists of seven main spans 331 ft. long and six approach spans 105 ft. long, and costs $11,000,000.

The bridge is supported on masonry piers founded on wells sunk by open dredging through 60 ft. of water and 80 ft. of sand and clay.

George Pegram Dies Aged Eighty-One

Chief engineer of New York subway firm was past president of A.S.C.E.

George H. Pegram, chief engineer of the Interborough Rapid Transit Co., New York, honorary member and past president of the American Society of Civil Engineers, died at New York on Dec. 23. Mr. Pegram would have been 82 years old on Dec. 29. He had continued active in his position of chief engineer of the I.R.T. and its subsidiaries for 32 years and had been active in engineering for 60 years.

Born in Council Bluffs, Iowa, and graduated from Washington University in 1877 at the head of his class, Mr. Pegram began his active career on the Utah & Northern R. R., now part of the Oregon Short Line. Two years later he was offered the position of principal assistant to C. Shaler Smith of St. Louis, then one of the leading specialists in bridge design in this country. The offer came about through the fact that Mr. Smith had served as chairman of a committee that had awarded Mr. Pegram first prize for his thesis at the university, a paper which had included detailed designs for a trainshed for the Boston & Lowell station in Boston.

After two years in consulting work Mr. Pegram resigned in 1880 to become chief engineer of the Edge Moor Iron Works, Wilmington, in which capacity he designed the Kansas City elevated railway. This position he resigned six years later to open an office as a consulting engineer in New York.

While with the Edge Moor Iron Works Mr. Pegram developed the Pegram truss, a curved-chord truss in which the web members were so disposed as to obtain the maximum economy of metal. Several of these trusses were built while Mr. Pegram was serving as consultant engineer to the Missouri Pacific Ry. subsequent to 1889. During this latter period he developed a new type of trainshed for the Union Terminal at St. Louis, a type that was subsequently used for the South Station at Boston and for the P. R. R. Camden Station at Philadelphia. While with the Missouri Pacific, also Mr. Pegram with Prof. F. E. Turneaure inaugurated the first bridge impact tests ever undertaken.

In 1893 Mr. Pegram became chief engineer of the Union Pacific system, then controlling about 9,000 miles of railway, and continued in that work until 1898, when he was named chief engineer of the Manhattan Elevated Ry. Co., New York, which was then contemplating numerous extensions of its elevated lines to head off the then-proposed subway system. The projected extensions never were made, but Mr. Pegram devoted himself during the next seven years to the problems involved in the change-over from steam to electric power. Adding a third track to the elevated system also was done under Mr. Pegram's direction.

GEORGE H. PEGRAM

Larger responsibilities came to Mr. Pegram in 1905, when he was appointed chief engineer of the Interborough Rapid Transit Co., and of the Rapid Transit Subway Construction Co. The latter company undertook Contract No. 2 of the first subway system, an extension of the city-built line southward from City Hall to the Battery and under the river to Brooklyn. As chief engineer Mr. Pegram supervised construction of the first of the East River tunnels, built in 1907. In subsequent years as the Interborough System was developing he directed the engineering activities of that system and its subsidiaries. In more recent years, though he continued as chief engineer, Mr. Pegram has passed more and more of the active work to his assistants.

Mr. Pegram joined the American Society of Civil Engineers as a junior member in 1880 and always was actively interested in its affairs. He was elected president of the society in 1917 and made an honorary member in 1931.

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Pioneer Engineer Honored In Radio Broadcast

A radio dramatization of the life of James Buchanan Eads, pioneer American engineer and bridge builder, will be broadcast Jan. 5 from 8 to 8:30 p. m. E.S.T. over the national network of the Columbia Broadcasting System.

The dramatization will appear in the program "Cavalcade of America," which is sponsored by the DuPont Co.

WASHINGTON HIGHLIGHTS

Special reports by Paul Wooton

Reports of faulty construction of the Locke Field Apartments, a $3,207,000 PWA low-rent housing project in Indianapolis, have led Nathan Straus, head of the U. S. Housing Authority, to direct that an investigation be made which may possibly be extended to other PWA projects recently taken over by U.S.H.A. A three-man committee of experts has been sent to Indianapolis to determine the causes for various defects reported in the Locke Field development, which include seepage through the roof and walls resulting in buckling floors and falling plaster.

Meanwhile, payments to the contractor on the nearly-completed development have been suspended. Unofficial reports indicate that the contractor denies liability, on the ground that specifications were followed exactly and that suggestions for improvement of the design details were rejected when made.

Successful negotiations of a gentlemen's agreement involving material reduction in the labor cost of one 300-unit housing project leads to the belief that similar concessions will be forthcoming, as was the case in the United Kingdom. Housing officials admit that prospects are not as good here for the acceptance of larger total wages in lieu of high hourly rates because "British labor has grown up."

Cities that need housing worst to replace slum dwellings are least able to put up the ten per cent required by the pending housing bill. For instance, a constitutional amendment would have to be put through in Illinois before any city in that state could put up any money for housing.

Nathan Straus hopes to get through an amendment under which more of the city's contribution would be applied to rent reduction. Slum dwellers, it has been found, pay rents varying from $5 to $6.50 per month. Costs of the proposed projects vary from $10 to $12.50 per room. If cities will assume a responsibility in taking care of the deficit in rents, difficulties incident to the raising of a share of the loan will be avoided.

Mr. Straus believes slum areas are forever blighted for residential purposes. He wants his projects on outlying tracts where land is cheap.

News continued on page 1065

Lincoln Tunnel Is Opened

New Hudson River crossing at New York City dedicated by officials Dec. 21

Amid oratory, military parades, artillery salutes, bomb explosions, screeching whistles, and fireboat displays the Lincoln Tunnel, second subaqueous vehicle crossing of the Hudson River between New York City and New Jersey, was ceremoniously dedicated on Dec. 21. The tube, 1.6 miles long, was thrown open to toll-paying traffic early on Dec. 22. Frank Ferguson, chairman of the Port of New York Authority, builders and owners of the tunnel, outlined the history of trans-Hudson traffic facilities and paid tribute to the engineers and contractors responsible for the creation of the latest of these facilities. Gov. Lehman of New York dedicated the New York plaza, and Gov. Hoffman performed similar ceremonies on the New Jersey end. City, state, and national officials were in attendance. Mayor LaGuardia and Secretary of the Interior Ickes spoke at a banquet after the field ceremonies.

The Lincoln Tunnel extends from Weehawken, N. J., to 39th St., Manhattan. At present one tube will carry traffic both ways, but upon completion of the second tube, now under way, one-way traffic will be carried through each tube, as is the case at the Holland Tunnel, three miles downstream. On the New Jersey end, the roadway will be carried over a looping viaduct to a depressed roadway across the Palisades, connecting with through state highway routes to the west. These approaches are now under construction. In Manhattan a new street has been cut through between Ninth and Tenth Avenues for the approaches to the south (present) tube. Entrance to the north tube, now being built, will be over the depressed N.Y.C.R.R. tracks.

The Lincoln Tunnel boasts of several distinctive features, including deaired brick paving and a glass tile ceiling. It is 21½ ft. wide at roadway level, 18 in. more than Holland Tunnel.

O. H. Ammann, director of engineering, J. C. Evans, chief engineer, and Chas. S. Gleim, construction engineer, have charge of the project for the port authority.

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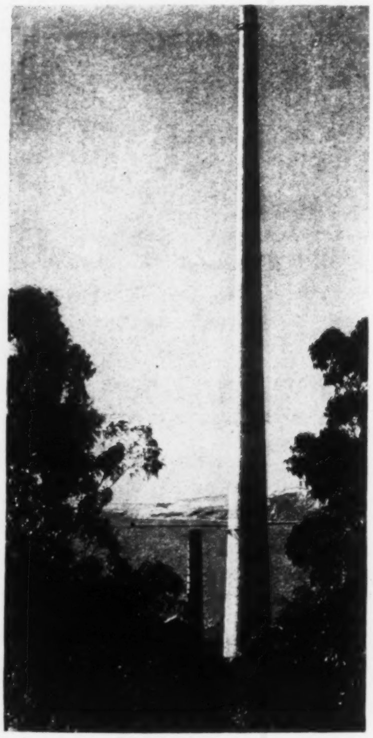
Lowered Tolls To Be Tried On Gate Bridge

Directors of the Golden Gate Bridge and Highway District reduced tolls on the bridge as an experiment for a ten-day period, Dec. 23 to Jan. 3. The regular toll is 50 cents; the reduced toll is 30 cents one way, or 50 cents round-trip, thus making the holiday "bargain rate" the same as the fare on the ferry, which is operating in competition with the bridge.



CHIMNEY HEIGHT SETS RECORD

THIS REINFORCED CONCRETE chimney 605 ft. high was completed this fall for the Selby smelter of the American Smelting & Refining Co., on an upper arm of San Francisco Bay by the Alphons Custodis Chimney Construction Co., of Chicago. It tops the 600 ft. height of the Nippon Mining Co. chimney in Korea, noted in our issue of Dec. 9, page 919, as being the tallest in the world.

The inside diameter of this chimney at the top is 13 ft. and the wall thickness is 7 in. The wall thickness at the bottom is 25 in. and the outside bottom diameter is 44 ft. The chimney is founded on an octagonal concrete slab 9 ft. thick, so designated that the load transmitted to the soil is not more than 8,000 lb. per sq. ft. The extreme top of the chimney is surrounded by a ceramic cap anchored to the concrete with Monel metal bolts.

The upper 300 ft. of the chimney is treated on the outside with three coats of silicate of soda over which paint will be placed to increase the visibility. The interior has been treated with a coating to resist gases.

Col. Kingman Is Appointed Assistant Chief Engineer

The President on Dec. 21 sent to the Senate the nomination of Col. John J. Kingman as assistant chief of engineers, with the rank of brigadier-general. The appointment is effective Jan. 1. Col. Kingman is at present on duty at San Francisco as engineer-in-charge of river and harbor improvement in the Southern Pacific Division. He is also president of the California Debris Commission and a member of the San Francisco Harbor Line Board. He will succeed Brigadier-General George B. Pillsbury, who is retiring on Dec. 31, after more than 30 years' service in the army.

Col. Kingman graduated from West Point, standing fourth in his class, in 1904. He was promoted to captain in 1912, to major in 1916, and to colonel (temporary) in 1918. He received a permanent appointment as lieutenant-colonel in 1927 and as colonel in 1935. After his graduation, Col. Kingman served for some years in the Philippines on construction of defensive works. The outbreak of the War found Col. Kingman an instructor in the army engineer school, and in 1917 he became chief of staff of the 90th Division, serving at Camp Travis, Tex. In 1918 he went overseas with his division.

Returning to the United States in 1919, he served with the War Plans Division until 1924, and, after a few years' service as commanding officer of the First Engineers, he became district engineer in charge of river and harbor work at Milwaukee. In 1930 he returned to Washington and served in the office of the chief of engineers for three years. Then, after service as district engineer at Providence and at Boston, he was appointed to his present position at San Francisco last year.

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Sutherland Not Ready To Buy Power Firm

Directors of the Platte Valley (Sutherland) Power and Irrigation District declined Dec. 16 to authorize immediate negotiations for the purchase of the Western Public Service Co. The Tri-County project directors decided to institute such negotiations last month as a start in buying out the private utilities throughout the state (*ENR*, Dec. 2, 1937, p. 882).

The Sutherland directors are waiting until they have received reports of a study by attorneys of provisions of Nebraska law which would prevent possible resale of parts of the power company's property to municipalities in the state.

COMMENT AND DISCUSSION

Readers' opinions on matters that concern the engineer

The Indian Way

Sir: After reading several of the unique descriptions of property that have been recently published, it occurred that the following might be of interest to some of your readers. The said description appears in Vol. 1 of the *Memoirs* of the Historical Society of Pennsylvania.

". . . lying on the west side of Delaware River, beginning at a certain creek next the cold spring, somewhat above Matinicum [Now called Burlington Island, lying between Burlington and Bristol] Island, about eight or nine miles below the Falls, as far above the said Falls as the other is below them, or furthest that way, as may be agreed upon, to some remarkable place, for the more certain bounds; as also, all the islands in the river Delaware within the fore-mentioned limits, both below and above the Falls, excepting only one island, commonly known by the name of Peter Alrick's Island, together with all the creeks, &c., &c., to the said tract of land belonging along the river and behind into the woods," &c. The consideration, amongst the detail of ammunition, clothing, &c., exhibits the amusing predilection of the grave Sachems for fifty looking-glasses and one hundred jewsharps. It also contains covenants of seizin an quiet enjoyment, breaches of which, I presume, could only be effectually tried by the sword. This tract of country was selected probably for the peculiar excellence of its soil, and patents were granted for it by Andros to English settlers before the country bore the name of Pennsylvania (1 Proud, 217). The lands below at that time remained in the tenure of the Indians, as a commission was three years afterwards issued by Andros to Cantwell and Hannum, to purchase from the savages the land as yet unpurchased from the Indians, "below the late purchase at the Falls, on the western shore of Delaware River."

In mentioning the above description, the *Memoirs* state, "it is an Indian deed of as early date as 1675 to Edmund Andros, Governor and Lieutenant of the Duke (New York) for land lying at least twenty miles above Philadelphia. This deed is perhaps the earliest made by aborigines to the English of lands on the west shore of the Delaware and exhibits a curious but not uncommon uncertainty of boundary that strongly displays the ignorance of the whites of the topography of the country."

THOMAS BUCKLEY
Assistant Chief Engineer
Philadelphia, Pa., Dec. 22, 1937

Steel Walls Used in 1931

Sir: In your last issue, p. 309, you state that the Armco building represents the first use of steel walls on a large scale. Herewith are photographs of the Strong-Carlisle & Hammond Co. building at 30th and St. Clair Sts. and of the Stahl Gear & Machine Co. building at 3990 Hamilton Ave., Cleveland. The first was put up in 1931, the second in 1936. In these buildings 10 gage steel was used for siding backed with 1 in. of insulation.

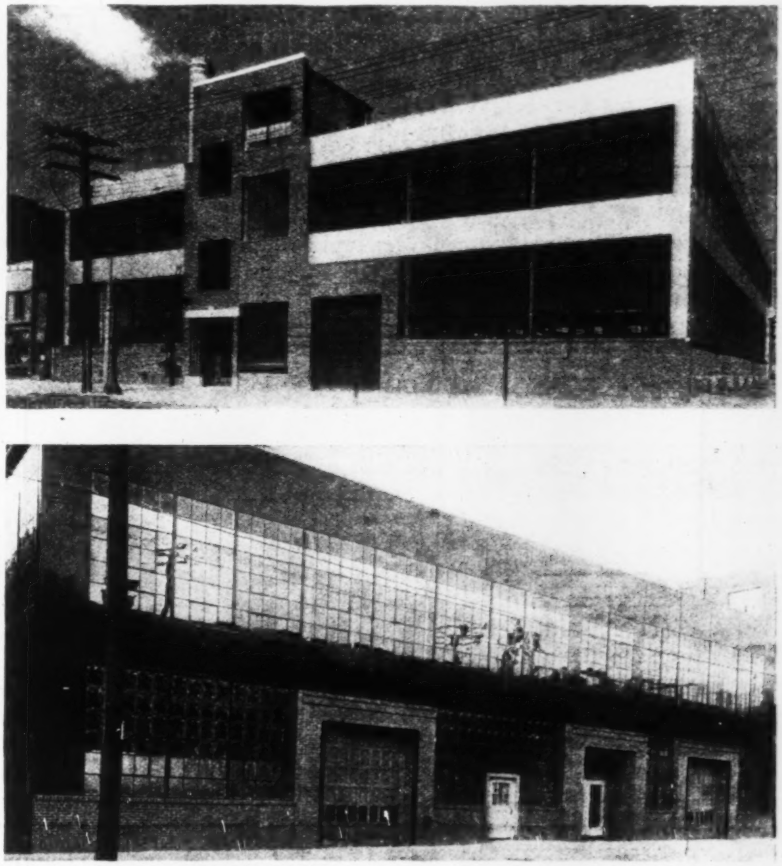
Their use has developed no weaknesses thus far and both owners are delighted, both with the results and the low cost.

H. M. MORSE
Architects and Engineers
Cleveland, Dec. 13, 1937

Field and Office

Sir: In typing the article that appeared in your issue of Nov. 11, p. 798, I made a typographical error in the formula for S. The sign in the formula should be plus, instead of minus.

THEODORE DOLL
Chicago, Ill., November 19, 1937



Insulated steel walls were used in the Strong-Carlisle & Hammond Co. building (upper picture) in 1931, and in the Stahl Gear & Machine Co. building (lower picture) in 1936.

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Editorial Offices at 330 West 42nd Street, New York
DECEMBER 30, 1937

A Privileged Statement

THAT THE TRUTH MAY BE KNOWN concerning a matter that has received wide circulation through the newspapers we place the following facts on record here. A few days before Christmas a subcommittee of the Senate made an unusual contribution to peace and good will among men by publishing a list of business and industrial concerns which, it alleged, had employed "labor spies". The list included the name of the publisher of *Engineering News-Record*, the McGraw-Hill Publishing Co. The implied charge against this company is wholly devoid of foundation. The company has never employed anyone to spy on its staff or in any manner to work counter to constructive relations within the company. On the contrary, at all times it has done what it could to aid and protect its staff. Thus, during a widespread strike of elevator operators some years ago, a strike which did not involve any of the company's operators or staff, it engaged several guards to protect its employees and tenants from outside violence. There was no labor controversy within the company, but as roving bands were besieging and entering many buildings, and intimidation and injury to persons and property were common, the company felt in duty bound to protect its staff and tenants from risk of harm, and this it did. The subcommittee had every opportunity to inform itself of these facts; as far as we have been advised it failed to take advantage of the opportunity.

RECENT ROAD-BASE FAILURES throw new light on moisture action in soils. Some subgrades that when exposed to the air remain firm and undistorted are found to soften and swell or heave when sealed from the air by a waterproof bituminous covering. Capillary groundwater action is reasonably assumed to be the disturbing cause. But road engineers so far have not been able to foretell where and when the effect is likely to appear. All of which sets a task for the research worker in the new science of soils. By pointing to this unexplored field of study and the immediate call for pioneer exploration, the discussion at the bituminous road conference two weeks ago served a good purpose. With the active interest there manifested and with the aid of present resources of soil study, useful conclusions should soon emerge.

Pipe Pile Progress

THE STEEL PIPE PILE took definite place as a means of overcoming difficult piledriving conditions in the building of New York City's West Side express highway, as described in this issue. In this great work also a wealth of ingenious practices was added to the art of steel pipe piledriving. While the stupendous figure of feet of pile driven is first to attract notice, it is the advance in construction technique that is most significant. Pipe pile work was extended virtually into the field of the open caisson. In this development lies its claim to attention where underground obstacles oppose penetration. The New York work proved that the pipe pile not only is capable in the conventional service of the solid pile but permits also of excavation procedure to cope with material that cannot be penetrated or forced aside by mere driving strength and power.

Not Economy

ECONOMY WAS NOT THE MOTIVE back of the President's proposal to rescind federal road aid for the coming fiscal year, it now appears. Last week he revealed that he did not intend to save the road tolls withheld from the road fund but merely planned to spend the money in another way. The indicated reasons revolve around an evident misconception of fact. In writing to chairman Cartwright of the House roads committee after the revocation proposal had failed, the President stated that he had meant to use the road money to make more relief-roll employment. He admitted that by so doing he would throw present workers out of their jobs. Since the absurdity of undertaking to promote the public welfare by depriving self-supporting workers of their jobs in order to make place for reliefers is apparent, he went on to justify his plan by the fallacious statement: "I must eliminate the proposed expenditures which provide the least work and favor those expenditures which give the most work"—the latter phrase referring to WPA activities. These are strange words from one who cast millions of the taxpayers' dollars into the sea at Quoddy. But Quoddy aside, the fact is that substantially every cent of the road-building dollar goes to wage payments, as was proved by painstaking investigations carried out by the Bureau of Public Roads. If WPA spending can do better than this, perhaps all public money and jobs ought to be turned over to it. A WPA staff in the White House secretariat and the State Department, WPA scientists in the Public Health Service and WPA district engineers on river and harbor work would have at least instructional value.

Unions and Employment

ENGINEERS ARE AMONG THE FIRST to feel the effect of a slowing down of industrial operations. Already the engineering forces of some large companies have been cut, as noted this week in the report of a meeting called by the Federation of Architects, Engineers, Chemists and Technicians to plan to cope with unemployment. In this situation the means normally used by trade unions to attain their ends are of little avail. Past effort of unions in fixing wage scales by agreement with employers serve to speed layoffs and increase the number of men thrown out of work. With flexible rates of pay men can be kept on payrolls—as they have been in many past cases—by spreading the available work and pay; with inflexible rates the only way to trim to the weather is to lay off men. Will the leaders of the new engineering union movement meet the situation by going to employers with whom they have agreements to suggest downward revision of wage rates with a view to keeping the largest possible number of men on the payroll? That would be real statesmanship.

Courting Unsoundness

TWO FISCAL DEVELOPMENTS in the housing field during the past week need careful scrutiny and thought. One relates to amendments to the act under which the Federal Housing Administration operates in the interests of private housing; the other concerns a proposal to alter the rules under which the new national Housing Authority will loan municipalities money for public housing.

Under the amendments, FHA will insure housing loans up to $6,000 on which a 10 per cent down payment is made, while for loans from $6,000 to $10,000 the necessary down payment is 14 per cent. These are reductions from a former flat 20 per cent. Making the down payment painless is an old installment-selling device, which carried to an extreme is definitely unsound. It is true that England used the 90-per-cent-loan plan successfully on a large part of its low-cost housing, but at 3½ per cent against our 5½ per cent rates. The 90 per cent loans that the FHA fosters may not be a bargain, and if so a housing boom based on them is hardly a sound investment.

Turning now to public housing, the Wagner-Steagall Act provides for 90 per cent loans by the federal government and 10 per cent local contributions. But cities, used to WPA improvement gifts, find the 10 per cent contribution impossibly burdensome. Taking them at their word, the USHA has proposed loaning them the full 100 per cent, yet if slum clearance housing is ever to amount to more than a federally directed social experiment, there must be definite local responsibility for it. The municipality that stands to gain from such housing should have some financial stake in it. Furthermore, unless the local Housing Authorities are able to develop financial initiative and secure city cooperation and aid, private capital will not be attracted to their investments. Since upon such private participation rests the eventual success of the public housing program, it would seem advisable not to put obstacles in its way at the start. Cities that cannot pay had better be left out.

The FHA deserves credit for the reforms, modest though they be, that it has brought about in mortgage lending practices. The USHA has given evidence in its advance planning of a realistic approach to the public housing question. In the further development of their programs, unsound and questionable practices should be guarded against most carefully.

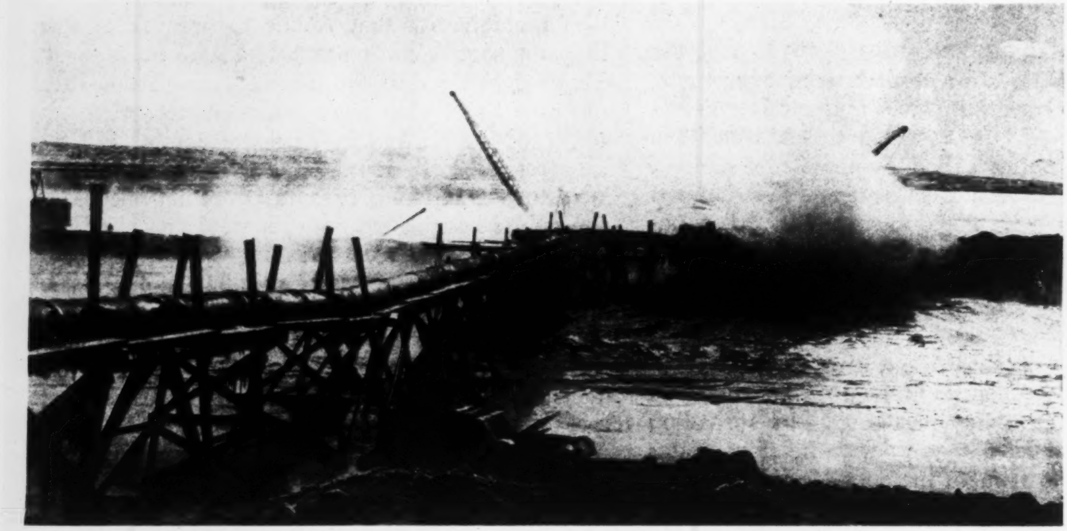
Dollars From Disposal?

PEERING AT THE FUTURE not through a crystal ball but through test tubes and glass laboratory tanks, Dr. Willem Rudolfs sees possibilities of by-product recovery from sewage. With commendable conservatism he emphasizes that most of the possibilities are far in the future, but he urges the researcher to set his aim ahead.

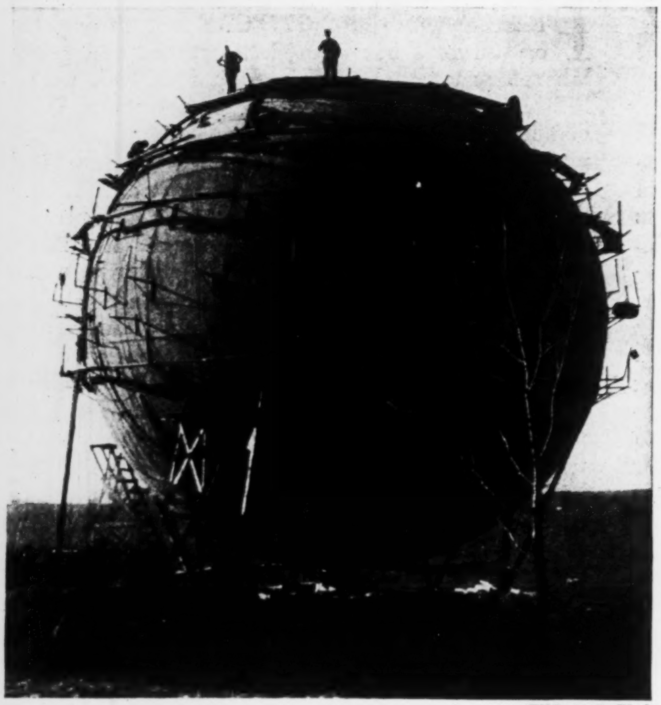
By-product recovery from sewage has proved feasible in some important instances. Not least important is the use of sludge-digester gas for power. And there is also the application of sludge to soil for fertilizing and conditioning, an adaptation of an age-old practice recently modernized so successfully that many treatment plants now embody provision for present or future fertilizer production. Modified treatment methods may make possible the salvage of other by-products that the laboratory has succeeded in producing: alcohol, organic acids, hydrogen gas and insecticides. Many seasoned investigators will not share Dr. Rudolfs' optimistic views, and will point to countless fanciful past proposals for salvage of sewage values. But this need not deter earnest research workers from extending their investigations.

Even more promising than salvage from domestic sewage is the recovery of values from trade wastes, a field in which much has been accomplished but far more still remains to be done. Establishment of the profit motive in waste treatment can do more to control stream pollution than legislation. The dollar objective plus the public health objective would give impetus to treatment plant construction.

PICTURES IN THE NEWS

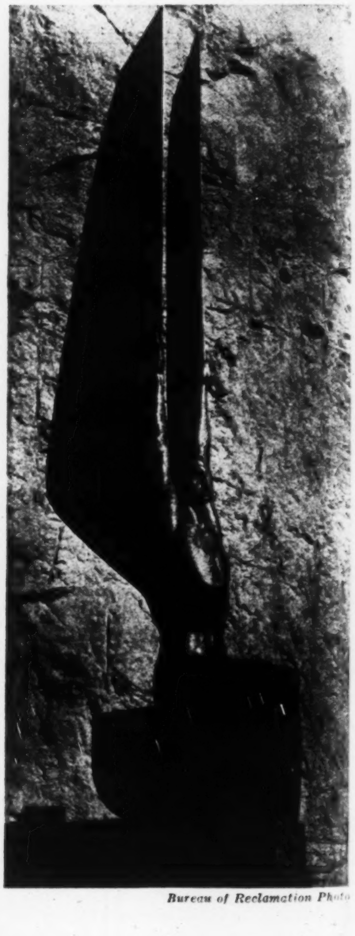


WINTER AT FORT PECK. Clouds of water vapor arise as the discharge from one of the U. S. Engineers' dredges meets an air temperature of 14 deg. below zero. A portion of the lake above the dam is seen in the background.



ENR Staff Photo

THE BIG APPLE in the sewage treatment field. Above welded steel sludge gas holder will be a part of the Southerly sewage disposal works under construction in Cleveland.



A GUARDIAN OF BOULDER DAM. This winged figure overlooks Black Canyon and the dam. Together with its twin it is mounted on a large black granite flagpole base.

Bureau of Reclamation Photo

Piledriving in Debris Fill

Contractors develop new driving machines and methods in building the steel-pipe-pile substructure of New York's express highway

THE FOUNDATIONS of the West Side express highway in New York City called for one of the largest piledriving operations ever carried on in building a single structure. If comparison is limited to concrete piles and piles of steel pipe the New York express highway work probably exceeds any other in footage (637,483 ft.) of piles driven. Add 23,560 ft. of wood piles and we have the full count of the piling put into the ground. A length of 681,000 ft. is hard to envision; let us get it down to the equivalent 130 mi. But length is only a smaller factor of the piledriving problem; the really tough operation was to get the piles to sound bearing through a debris fill that gave about every driving condition that a contractor does not want.

As stated in the preceding article on caisson sinking for the highway foundations (*ENR* Nov. 4, 1937) these conditions result from building out the Hudson River shore line during a century or so with stone-filled cribs, rock fill and debris of all sorts. Paved over, this made land is the location of the express highway and every foundation had to penetrate it to rock or firm ground just above rock.

Fill limited pile types

Pre-cast concrete piles would not go down, except in scattered locations; neither would cast-in-place piles, poured in a light steel shell driven with a core. Wood piles could be, and have been driven, but the wood pile is an uncertainty in the ground with which the builders of this express highway were confronted. They have been used only under ramp walls for light loading. Nothing could be put down, in the end, for most of the main footings but a steel-pipe pile, or an adaptation of it. And the pile had to be of sufficient size to carry its load to rock as a column, even where that meant a diameter of 1½ ft. with rock 185 ft. below cutoff. Also, the pile had to have sufficient thickness of shell to withstand driving under the most severe conditions ever encountered, conditions which stopped, broke or tore up all ordinary types of piling before a load-bearing stratum could be reached.

In general, the smaller and more rounded stone used to fill the old bulkhead cribbing buried under the downtown stretches of the highway proved to be penetrable to pipe piles fitted with conical points, although in actual construction most of the contractors removed the cribbing and rock down to the limit of economical pumping, which was about 10 ft. below ground water level. In this section of the work, which came under the Bureau of Highways, Borough of Manhattan, therefore, most of the piles were pointed. All have been driven to rock except in places below Canal St. where the packed gravel or hardpan overlying rock furnishes an equally good foundation. Refusal has been taken at 50 blows to the inch, which will not damage a pointed-pipe pile in this material. In the gully at 125th St., similar conditions were met, and the same type of piles was employed, many of them also driven to refusal in the gravel, and successfully load-tested up to

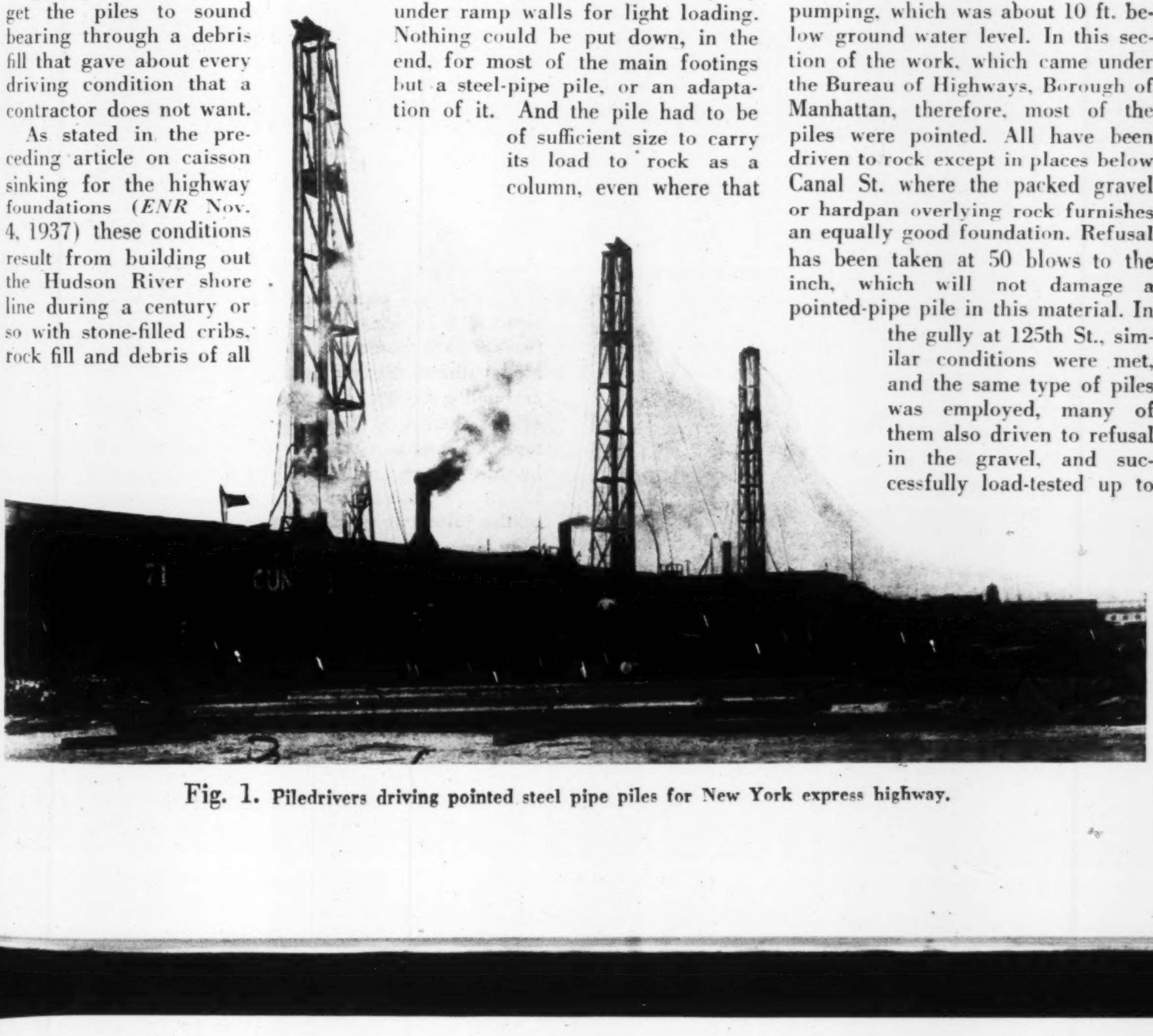


Fig. 1. Piledrivers driving pointed steel pipe piles for New York express highway.

200 tons per pile. Also in the gulley which lies between 135th and 146th streets, on either side of the caisson section, 13,500 ft. of these heavy steel-pipe piles were placed.

In portions of the work which lay over original ground, and where the penetration was not great, 2,000 ft. of pre-cast concrete piles were successfully driven between 76th and 79th streets, and 50,000 ft. between 83rd and 94th streets. From Cedar to Canal streets and 23rd to 38th streets, between 200 and 300 wood piles were used under light ramp walls. And a small footage of combination piles was employed between 94th and 98th streets. These consisted of open-end casings with a pointed pipe section driven below them, after which the upper sections were lined with corrugated metal for concreting and the casings were pulled and re-used.

Elsewhere above 72nd St., however, rock fill was met, and the engineering officials of the New York Central R.R., in charge of this portion of the work employed the open-end-pipe pile or an adaptation of it as the only means of penetrating the freshly-blasted, irregular stone, running into large sizes, which had been dumped there. A large stone of this sort can stop a pointed pipe pile, and there is no way of determining whether the point is on bed rock, or on a "subway plum" in mud, which may slide or sink later, except by interpolating between the observed depths of the nearest borings.

A steel shell with an open end necessarily fills with material as it goes down, and it has to be "blown" with an air jet of 100 to 135 lb. pressure. A portable compressor plant of 900 to 1,200 ft. capacity, as large as that required to sink the 42nd St. shaft of the Queens vehicular tunnel (*ENR* July 22, 1937) is necessary for this blowing operation.

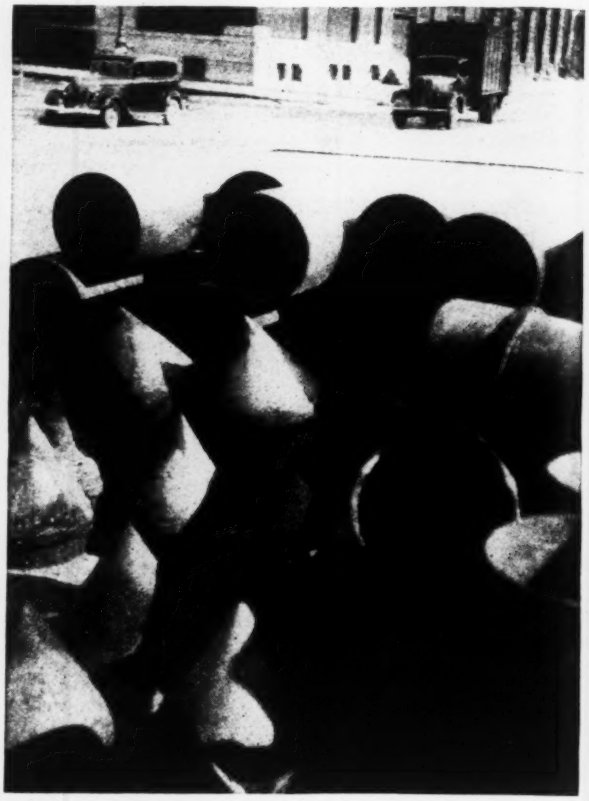


Fig. 2. Pile points and splicing sleeves stocked ready for use on steel pipe piles.

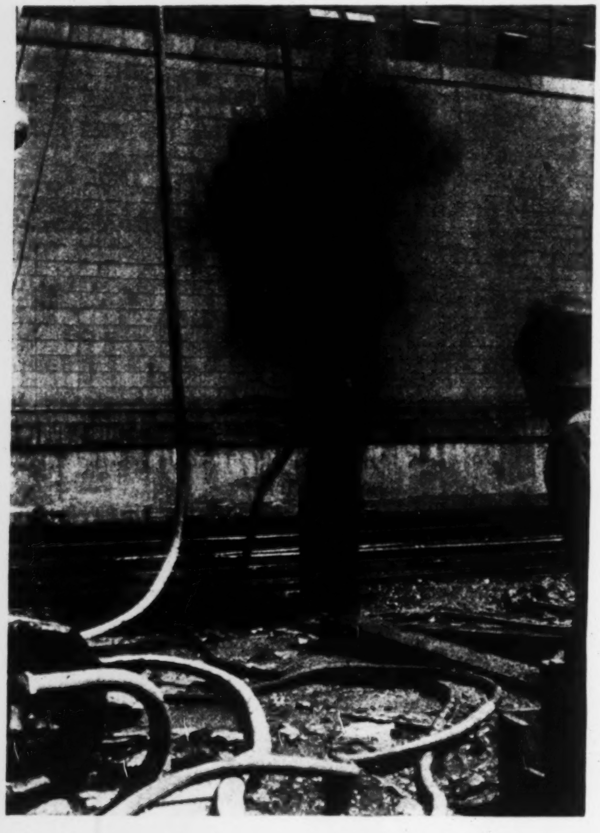


Fig. 3. Geyser of water and earth formed in blowing open-end piles by compressed air.

Driving methods

All the steel pipe piles used on the work have had shells ½ in. thick. All points and sleeves, for joining two sections where the entire pile could not be assembled without driving it part way, were of cast steel, and had a driving fit, up to ⅛ in. for 18 in. pipe. Some of the sleeves first employed above 72nd St. had a taper fit, but this was later changed to a straight fit, because of the greater rigidity and resistance to bending at the joint when obstructions were struck. Some of the joints were welded at the sleeves in the beginning, but this practice was found to be unnecessary. Some of the pipe used has been lap-welded, and some seamless. Both have given satisfaction. The sleeves and points used were inside-fit, as may be seen from the illustrations, and so left the outside surface of the pile smooth to eliminate possibility of damage from friction in driving.

Pointed Piles.—With the pointed piles, the point and a section of pipe were assembled in the leads and driven down. If the pile was longer than one section, a sleeve was set in, another section of pipe set on top

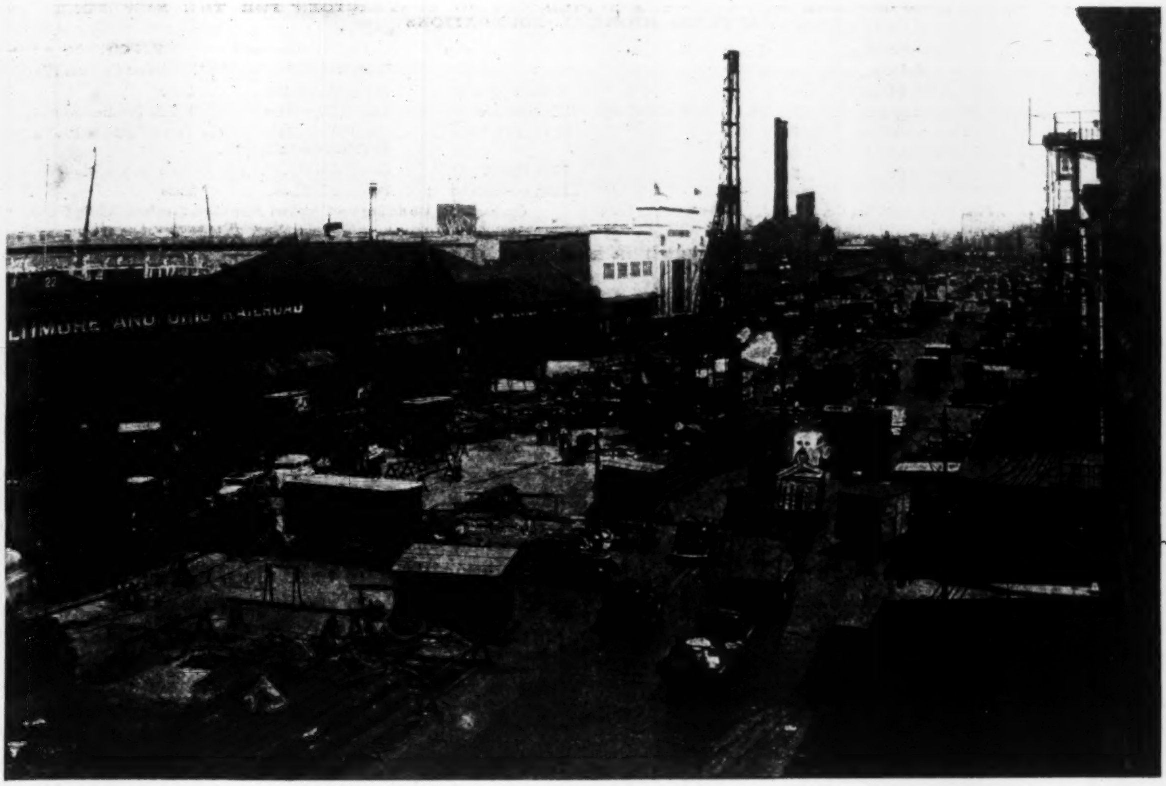


Fig. 4. Fitting the pile driving operations into the traffic in downtown New York.

of the sleeve, and driving resumed. The driving closed the joint tight as the pile went down. No jets could be used below 38th St., because the resulting damage to the pavement would have been too great; and as a matter of fact, no water jetting during driving was tried at any time on the work. The contractors who have put piles through the riprap above 72nd St. are unanimously of the opinion that the stone encountered ran much too large in size to be displaced by jetting, and even those whose drivers were well equipped for the purpose, did not try it. Consequently, wherever pointed pipe piles struck hardpan or packed sand and gravel, they were driven to refusal and left. As previously stated, under city specifications, refusal was taken as at least 50 blows to the inch. On the stretch where the highway crosses 125th St. piles were load-tested after driving to refusal. A load of 200 tons of caisson weights was placed on single 18-in. piles a day or two after driving, allowed to stand some days, and removed. The maximum settlement was $\frac{3}{4}$ in., and the rebound after removing the load was $\frac{3}{8}$ in.

After the pile is down, an electric light, usually about 200 watts, is lowered to the bottom; some inspectors used shielded lamps and simply encased them in a wire guard. They made any split or damage to the pile plainly visible, and also made it easy to tell if the pile was more than the allowed 1 per cent out of line at a joint. After the piles were driven, usually to rock, inspected and accepted, they were cut off with a torch at grade and concreted. Most of the contractors used commercial concrete delivered in truck mixers; only one or two employed a small portable mixer, with aggregate delivered in batch trucks.

Open-End Piles.—With the open-end piles driven in rock fill the procedure was a little more complicated. The piles were driven, in all cases to solid rock, and the driving problem was to handle the loose rock met on the way down. When piles were stopped by rock in the fill, several things could be done. If the stone proved too large for a ram to crack, or a concrete-filled, pointed steel spud to displace, a pit might be sunk to remove it. Actually not only pits, but long trenches were excavated in several locations to remove as much of this material as possible before driving began. One such cofferdam more than 100 ft. long was dug on the section between 111th and 121st streets. Another long trench was excavated under the south abutment and retaining wall of the 125th St. viaduct. Many pits were sunk, and there are stories of some single piles on which a thousand dollars were spent. In most cases, the procedure was to ram the rock with a piece of 8- to 10-in. shafting, 12 to 15 ft. long, or chip with a pointed 110-lb. rail, and blow out the pieces with a high-pressure air jet. After repeating this formula often enough, the pipe usually went down, even where it had been stopped by large stone.

At the 93rd St. underpass, however, where rock fill had sunk all the way to the bottom, all methods failed to drive 43 of the piles even after 20 ft. in depth had been trenched. Drill holes were finally sunk through each of these piles to bed rock, and the material shot with two sticks of 40 per cent dynamite every 5 ft. as the casing was pulled. A shot was fired, of course, in every stone drilled directly through. This

TABLE I—PRINCIPAL GENERAL CONTRACTORS AND PILE-DRIVING CONTRACTORS FOR THE NEW YORK EXPRESS HIGHWAY FOUNDATIONS

Section	Contractor	Pile Contractor
Cedar St.-Canal St.	Poirier & McLane	Same
Canal St.-23rd St.	Jas. Stewart & Co.	Same
23rd St.-38th St.	Poirier & McLane	MacArthur Concrete Pile Corp.
76th St.-79th St.	Frederick Snare Corp.	Same
83rd St.-94th St.	Poirier & McLane	Same
93rd St. & 100th St. Traffic Loops.	J. Leopold & Co	Same
94th St.-98th St	P. T. Cox Contracting Co.	MacArthur Concrete Pile Corp.
98th St.-111th St	Del Balso Construction Corp.	MacArthur Concrete Pile C
111th St.-121st St	Jas. Stewart & Co.	Same
St. Clair Place Abutment	Geo. F. Driscoll Co.	Moccia Construction Corp.
St. Clair Pl.-135th St	Geo. F. Driscoll Co. P. T. Cox Contracting Co.	Young Fehlhaber Pile Co.
135th St.-146th St	Geo. J. Atwell	Same
146th St.-160th St	Poirier & McLane	Same

Contractor for the drilling mentioned on this section, Standard Drilling Co.

TABLE II—KINDS AND FOOTAGES OF PILES DRIVEN FOR NEW YORK EXPRESS HIGHWAY FOUNDATIONS

Section	Type piles	Size piles inches	Total footage	Contract price per foot	Year begun	Year finished
Cedar St. to Canal St	Pointed Pipe Wood	12	18,000	$5 12	1937	....
		18	88,000	7 00	....	....
		..	10,000	....	....	....
Canal St.-23rd St	Pointed Pipe	10	102,959	3 00	1929	1931
		12	91,706	6 75	....	....
23rd St.-38th St	Pointed Pipe Wood	18	114,000	4 98	1931	1931
		..	13,560	....	....	....
72d St.-76th St	Open End Pipe	12	4,600	5 55	1934	1935
76th St.-79th St	Open End Pipe Precast	12	10,021	4 00	1935	1937
		16	5,350	5 00		
		14 oct.	2,056	1 50		
79th St.-83rd St	Open End Pipe Wood	12	12,843	5 25	1936	1937
			407	9 91	....	....
		16	2,886	.363	....	....
83rd St.-94th St	Open End Pipe Precast	12	3,680	8 50	1936	937
		:.	50,000	2 00	....	....
93rd and 100th St. underpasses	Open End Pipe	12 vert.	4,874	7 00	1937	....
		12 batter	4,242	8 00	....	....
96th St. Field House	Pointed Pipe	12 vertical	904	5 50	1937	....
		12 batter	123	6 00	....	....
		14 vertical	516	6 00	....	....
		14 batter	110	6 74	....	....
94th St.-98th St	Pointed Pipe	12	22,541	....	....	....
	Cased Concrete		5,590	....	....	....
	Open End Pipe	12	3,545	8 80	....	....
	Composite	..	2,298	....	....	....
98th St.-111th St	Open End Pipe	12 vertical	8,951	8 00	1936	1937
		12 batter	4,873	8 50	....	....
		14 vertical	3,605	8 50	....	....
		14 batter	1,830	9 00	....	....
		16 vertical	2,073	9 00	....	....
		16 batter	3,472	9 75	....	....
111th St.-121st St	Open End Pipe	12 vertical	3,637	7.67	1936	1937
		12 batter	3,740	8 43	....	....
		14 vertical	1,024	8 21	....	....
		14 batter	278	9 09	....	....
		16 vertical	1,683	8 76	....	....
		16 batter	4,473	9 75	....	....
121st St.-St. Clair Pl	Open End Pipe	12 vertical	9,057	7 28	....	....
		12 batter	3,320	7 35	....	....
		14 vertical	1,112	7 91	....	....
		14 batter	395	8 01	....	....
		16 vertical	109	8 74	....	....
		16 batter	3,166	8 88	....	....
St. Clair Pl. Abutment	Open End Pipe	12 vertical	4,500	8 38	1937	1937
		12 batter	750	8 88	....	....
		14 batter	4,800	8 94	....	....
		16 batter	450	9 32	....	....
St. Clair P-135th St	Pointed Pipe	18	12,000	6 45	1937	1937
135th St.-146th St	Pointed Pipe	12	4,000	5 92	1936	1937
		18	7,500	7 00	....	....
146th St.-160th St	Open End Pipe	12 vertical	3,000	8 10	1937	....
		12 batter	2,400	8 35	....	....
		14 vertical	7,200	9 50	....	....

proved to be the most effective method of all, as the piles went to rock at 4 or 5 blows to the foot after this treatment. The cost is said to have been nearly $2 per foot. Contractors on earlier sections rejected the idea of drilling and blasting under stuck piles, as likely to damage too many of them. But not one of the piles at 93rd St. was injured, though some tightly-wedged stones were shot out of the inside of piles with half a stick to the shot.

However, large rock were usually rammed to the bottom of the pipe in driving, and smashed against the next rock encountered, or against bedrock, and the heavy fragments blown out by air pressure; and rock, jet and sometimes the top of the pipe came up. The usual procedure, both in driving and in blowing piles landed on rock, was to use the ram first, and if it did not smash the rock, employ a pointed 110-lb. rail to chip it down to sizes that would blow out readily.

On the ramp approach to the 125th St. viaduct, near St. Clair Place, trouble was given by an old oyster bed. This lay about 30 ft. down, some 20 ft. above rock, and consisted of 18 in. of solid shells. The piles drove through it readily but inside each was left a neat 18-in. plug of cemented shells, which the rail would not penetrate, and the air pressure did not get below. The pile-driver crew on this section got the plugs out by still further sharpening the point of the jet (most of the 3-in. jet pipes used were cut off at a 45-deg. angle at the bottom) and working it around on top of the shells with large pipe wrenches. After several inches of the shells were loosened up, the loose pieces were blown out and the process repeated. Many of these plugs took as long as 2 hr. to remove in this way.

On the section from 146th to 160th streets, piles were chipped and blown in the manner described several feet into soft, disintegrated rock before a good bottom was secured. This part of the driving actually took less time than would be expected, and much less than some of the driving which went through rock fill.

In most of the blowing, the pile first had to be filled with water. Sometimes also a bag or two of mud might be dumped in, after lowering the jet, for a seal. Blowing produced a very clean bottom on the rock, and both the rock and the bottom of the pile could be easily inspected when a light was lowered. After a pile was cleaned out, if not immediately concreted, it had to be blown again before concrete was placed.

Aside from the precast concrete piles driven, all of which went into ground of the more ordinary kinds, the contractor for the section from 94th to 98th St. deviated from practice in two ways. The first was by driving a composite pile; the second by employing a cast-in-place pile with a light shell, set inside the ½-in. steel casing after the latter had been driven to rock and cleaned out. By pulling and using them over, a considerable tonnage of steel shells was saved. The upper part of the composite piles was made in exactly the same way, but before the light shell was placed for concreting, a pointed pipe pile for the lower part was driven through the upper ½-in. casing to rock with a follower. Only some 2,300 ft. of this type was placed.

Organization methods varied

The types of equipment and the organization of the work varied widely with the different contractors. Where footings were in the street, land drivers were preferred. Those used on the lowest section had to be provided with hinged leads to pass under foot bridges connecting with railroad ferries, and have been supplemented with a crawler crane carrying 75-ft. hinged leads. Under the traffic circle, 76th to 79th streets, two land drivers and a crane were also used. The sections from 94th to 111th streets were put in with two large land drivers each. But for the rest of the work above 72d St., the rough, uneven terrain caused the contractors concerned to stick to crawler cranes fitted with hinged leads and spreaders. The large number of 1 on 4 batter piles made the land drivers very useful where they were on hand. Other contractors got around this problem either by anchoring the bottom of the hinged leads at ground level and booming out till the required batter was reached, or by blocking the pile itself on the required batter where it was driven through the bracing of pits or trenches sunk to remove riprap. In the latter case, the pile hammer was simply set on top of the pile, and the load line of the crane slacked off enough to allow the driving block to seat, and hold the hammer in line with the pile. One contractor made slings which suspended the hammer on the required batter.

Most of the hammers used, both steam and air, were the largest on the market. A considerable footage of the smaller sizes of pipe, however, was driven with lighter hammers. Most of the land drivers had 60-ft. leads, and the hinged leads used on cranes ran from 40 to 75 ft.

Some of the contractors treated the work as an ordinary pile driving job. That is, they drove right along, from one pile and one footing to the next, putting each pile down, cleaning it out, and concreting behind the driver as they went. Where land drivers were used, this procedure was about the only one possible. But there were interesting variations from it where cranes were employed, especially when driving was through dumped rock. Of course, where pits were sunk to remove rock, cranes would move ahead and return to finish driving later. But the contractor who had the uppermost section finally developed a progressive system (using 3 cranes) by which one crane went ahead, setting all the piles and driving each till it stuck. The other two cranes followed up, ramming, chipping and blowing, and driving on down. These cranes did not leave a pile till it was on rock.

The pile contractor for the St. Clair Place abutment and ramp made a good record, however, by an entirely different system. Having first trenched under the footings of the abutment and west wall to remove stone as far down as the ground could be pumped (about 10 ft. below water) he used one crane, and put each pile down before the crane left it. Here, however, his procedure began to differ from that of others. He blew the piles at once, cleaning them out for inspection, and having his own organization inspect them to make sure they would pass. Instead of calling for inspection and concreting them, he cut them off, capped them, and waited till 30 or more were ready at a time. These would then all be blown, inspected and concreted at one operation. This procedure was designed to cut down the quantity of air used to a minimum. Where a large number of piles was saved up to be concreted in one operation, it was apt to be found that if they had not been thoroughly blown and then capped when first driven, considerable blowing might be required to clean them again. Three 315-ft. compressors were used on this section, as compared with four on most of the others, and they furnished air also for the pneumatic placing of concrete in walls.

The number of shifts worked depended on the time available. Pile driving is always best done by daylight, and a majority of the sections worked two shifts. Several, however, used only one for the most part, and on one or two difficult ones three shifts were necessary, at least for part of the time.

Direction

When completed, more than 150 miles of piling will have been driven for the Express Highway, the exact footage not being yet known until the design for the lowest section is complete. The accompanying tables summarize the types, footage and bid prices for the piles, the duration of work on the different sections, and the principal general contractors and pile-driving contractors concerned.* The three pile foundation sections below 59th St., extending from Cedar St. to 38th St., have been built under the Bureau of Highways, Borough of Manhattan, of which Clifford M. Pinkney is chief engineer. The other sections, from 76th St. north, have been constructed under the direction of the New York Central Railroad, J. W. Pfau chief engineer. Madigan and Hyland, E. H. Prager, chief engineer, have been associated with Mr. Pfau's office in the design and supervision of this section of the work.

* * *

Municipal Finance Technique Shown "Dated" Within Decade

TEN YEARS can date styles in municipal finance as well as styles in automobiles, in the opinion of A. E. Buck, of the Institute of Public Administration, New York City, at a recent conference of municipal finance officers.

Ten years ago emphasis was largely upon the preparation rather than the execution of the city budget. Budgetary control devices, such as monthly or quarterly allotments, were not generally understood or widely practiced. Capital budgeting was rarely employed, and very few cities could claim anything like comprehensive financial planning. Many expenditures were controlled by the exigencies of political circumstances.

Cost accounting, which accounts on a unit basis for expenditures, was still in its infancy. Financial reporting was largely a matter of form, and supplied little useful information. Centralized purchasing, which has since saved thousands of dollars for some cities, was still in the early stages of development.

In Mr. Buck's opinion, "there has been a vast change in the field of municipal finance . . . perhaps not enough yet to cope with the new situations that arise" but with indications of "making definite prog-

Pumps and Pipes Serve Three Objectives

by A. P. Malley
San Francisco Water Department

Water supply for new island in San Francisco Bay planned for large exposition requirements and later for smaller airport demand and fire protection

THE PUMPING EQUIPMENT to supply water to a newly-built, 400-acre island in San Francisco Bay and for the needs of the government controlled Yerba Buena Island is being planned with a three-fold objective: It must be able to deliver as much as 2.5 m.g.d. on peak days and 1.8 m.g.d. on normal days during the 288-day period in which the Golden Gate International Exposition will be open; later, when the site is made over into an airport it must be easily converted into a system that can continue to operate permanently on an economical basis while delivering at a rate of only 0.25 m.g.d. and finally, as an incidental requirement, the system must meet fire protection needs on the San Francisco Bay Bridge, where a series of fire hydrants is installed. How these several needs were met in selecting equipment and pipe diameters that would be economical in the long run is outlined in the following.

Immediately adjoining the exposition island to the south is Yerba Buena Island, where a suitable site was selected for a 3 m.g. reservoir with high-water elevation of 260 ft. above sea level. From this location water could be delivered to the exposition by gravity. It was decided to build a pump station at the San Francisco end of the Bay Bridge and pump water from the city mains through a pipe laid on the bridge delivering into the reservoir on Yerba Buena Island. A previous article (*ENR* Sept. 9, 1937, p. 428) described design of the pipe joints in the bridge pipe line where provision is made for an expansion-contraction range of 30 in.

The water needs on Yerba Buena Island were estimated at 150,000 gal. daily, and a 400-g.p.m. float-controlled pump will be installed on the island to deliver water from the new 3 m.g. reservoir to an existing reservoir about 70 ft. higher.

Water supply requirements

The pumping equipment necessary to supply the required quantities of water was specified as follows: (1) Two 175-g.p.m. pumps to operate permanently in supplying the needs of Yerba Buena Island and the airport subsequent to the period of service of the larger pumps required for the exposition. Each 175-g.p.m. pump is to have sufficient capacity to deliver individually the demanded quantity of water; the other is to be a stand-by-pump which can also be used for parallel operation should a greater flow of water be required.

(2) The 1.250-g.p.m. pump required for the normal water consumption of the exposition will also meet fire protection needs of the bridge and will be a permanent installation.

Finally, (3) the 1.700-g.p.m. pump will supply water for the exposition on days of peak consumption and will be used only during the life of the exposition.

It is seen from Table I and the head-capacity curves in Fig. 1, that with the required rates of pumping, the corresponding pipe friction

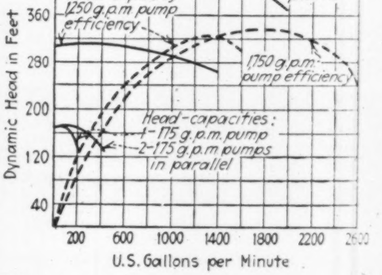


Fig. 1. Capacity and efficiency curves for the three sizes of pumps.

TABLE I.—COMPARISON OF FIRST AND OPERATING COSTS FOR THREE PIPE DIAMETERS

Size of Pipe (inches)	Pumping Rate (m. g. d.)	Head Losses (ft.) Williams & Hazen C = 130	Total Head (ft.)	Suction Head (ft.)	Net Total Dynamic Head (ft.)	m. g. d. x Head	Number of Days	Cost of Pumping $.0375 per 1 m. g. d. Lifted 1 foot (dollars)	Total Cost of Pumping for Exposition (dollars)	Difference in Pumping Costs (dollars)	Approximate Cost of piping and Pumps (dollars)	Difference in Cost (dollars)
8	2.5	672	935	128	807	2020	84	$6,370				
	1.8	359	622	137	485	872	204	6,700	$13,070	....	$81,000	
10	2.5	247	510	128	382	955	84	3,000		$6,470		$10,000
	1.8	135	398	137	261	470	204	3,600	6,600		91,000	
12	2.5	105	368	128	240	600	84	1,870		2,200		14,000
	1.8	58	321	137	184	331	204	2,530	4,400		105,000	
Figures below represent operating costs on the permanent basis												
8	.25	10	273	140	133	33	365	$450				
10	.25	4	267	140	127	32	365	437				
12	.25	2	265	140	125	31	365	425				

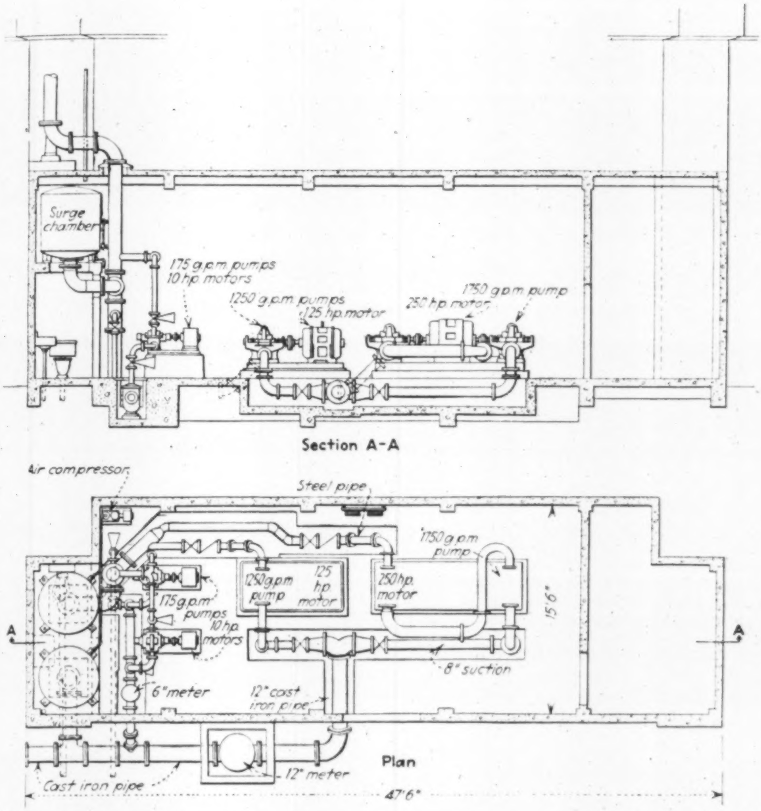


Fig. 2. **Plan and elevation of pumping plant showing arrangement of the four pumping units.**

TABLE II—SIZES AND CAPACITIES OF PUMPING EQUIPMENT

Motors (hp.) 440V	r.p.m.	Pump Ratings g.p.m.	Pump Ratings m.g.d.	Intake Diameter (Inches)	Net Total Dynamic Head (feet)
250	1750	1750	2.5	6*	405**
125	1750	1250	1.8	5	271
10	3460	175	0.25	2	142
10	3460	175	0.25	2	142

* Two stage
** 1200 g.p.m. against 446 feet.

losses vary widely. Thus efficient operation would not permit of coupling together, either in series or in parallel, any two units of different capacities, and the operating program therefore contemplates a separate pump capacity for each required rate of flow.

Factors affecting cost

The logical place for the pumping plant was near the bridge pier W-1 on the San Francisco waterfront. This location could be supplied from the city's 12-in. mains without constructing new supply lines. The flow here available will maintain a suction head for the pumps of 140 ft. for a 0.25 m.g.d. flow; 137 ft. for a 1.8-m.g.d. flow; and 128 ft. for a 2.5-m.g.d. flow. The static head against which the pumps must deliver, as determined by the elevation of the pipe outlet at Yerba Buena Island storage reservoir is 263 ft.

Early in the calculations a comparison was made of costs and head losses in pipe of three diameters, namely, 8, 10 and 12-in. laid across the bridge. Table I lists the results of these comparative studies. The cost of pumping is based on the prevailing average cost in San Francisco, i.e., 3.75 c. per m.g. per foot of lift. The life of the exposition was taken at 288 days in 1939, made up of 204 weekdays, during which the requirement would be 1.8 m.g.d., and 84 week-end days and holidays, when the requirement would be 2.5 m.g.d.

From figures in the table it will be seen that pumping costs showed no very great variation in the 0.25 m.g.d. rate as the pipe diameters changed from 12 to 8 in. For the maximum delivery of 2.5 m.g.d. a rapid increase in the cost of pumping appeared as diameters decreased from 12 in. to 8 in. Offsetting this was the even more rapid increase in the first cost of the larger diameter pipe. The economy of selecting a 10-in. pipe as compared to one of 12-in. diameter is apparent from the difference in total pumping costs of only $2,200 as against a saving in first cost of $14,000.

In choosing between a 10-in. and an 8-in. pipe it is seen that the latter shows a saving of $10,000 in first cost but would involve an increase in pumping cost of $6,470. As against this $3,530 saving favoring the 8-in. pipe, the smaller diameter would have required almost twice the power of the two larger pump motors and their electrical equipment, which would have made it impossible to use the pump station site in a recess of pier W-1 because a much larger floor area would be required. The 8-in. pipe also would have involved high water pressure (more than 400 lb. per sq. in.) and velocities over 11 ft. per sec., which, in view of the relatively small saving, made the 10-in. pipe a better and safer choice. Accordingly, the pipe on the bridge is all of 10-in. diameter (10¾-in. O.D. cement-lined pipe) except for the 8-in. and 10-in. galvanized seamless tubing used at the expansion joint as described in the previously published article.

Pumping plant

The pump station building is of reinforced concrete, built in a recess of the pier; the architectural treatment is of the utmost simplicity to match the massive bulk of the pier and there are no windows. Light comes in through a skylight extending almost the full length of the roof. The building is supported on piles; the pump foundations are carried on separate blocks not connected to the floor.

A compact arrangement of the pumping plant was worked out, as shown in Fig. 1. The sizes and the capacities of the units are given in Table II. The net total dynamic heads against which the pumps were designed to operate were specified slightly higher than the theoretical heads to insure deliveries of required quantities of water with possible variations in suction heads and friction

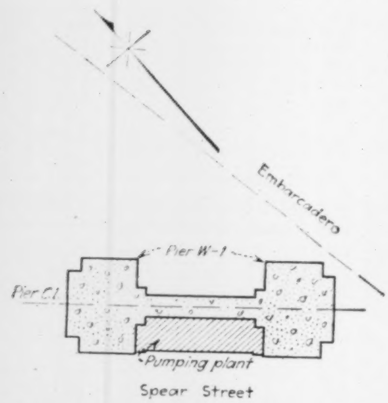


Fig. 3. Location plan showing pumping plant with relation to outline of pier W-1.

losses. On the two small pumps that will be used for the permanent supply, this point would be particularly important if it ultimately becomes necessary to couple these two pumps in parallel so as to raise the quantity delivered up to 0.5 m.g.d.

The surge compressor tanks shown in Fig. 2 were put in to minimize the shocks incidental to starting and stopping the pumps. These tanks, directly connected to the suction and discharge pump manifolds, are provided with glass water-gages and will be served by an air compressor to maintain a predetermined volume of cushioning air. The quantity of water pumped will be measured by one 6-in. and one 12-in. meter.

All motors will operate on 440-volt, 60-cycle current supplied through an 11,000-volt underground cable to three 100-kva. transformers in the station. The 250-hp. motor will have a starting compensator; all others will be of the across-the-line starting type. To keep the power-demand service charge to a minimum and because the two larger pump units are not to operate it simultaneously, the 250- and the 125-hp. motors will be connected to the supply line through a double-throw switch so that only one motor can be operated at a time.

Operating program

For serving the airport and the needs of Yerba Buena Island it is intended that the pumping plant shall be entirely automatic. During the exposition, however, an operator will be stationed in the plant to start and stop the two larger pumps and maintain the required water level in the reservoir as indicated by telemeters. This equipment includes a pressure-actuated indicating transmitter in a concrete housing near the reservoir and a recording receiver in the pump station at San Francisco. The devices will be calibrated for a reservoir depth range of 0 to 35 ft. and will have a 24-hr. recording chart. Through a series of adjustable contacts and relays the receiver after the close of the exposition will be required to start and stop either or both the 175-g.p.m. pump motors at predetermined levels in the reservoir.

The 1.250-g.p.m. pumps intended for fire protection on the bridge after the exposition closes will be operated by remote push-button control located in the firehouse on Yerba Buena Island. The connections are such that when the 1,250-g.p.m. pump is in operation the two smaller pump motors will be disconnected automatically and cannot be started either manually or by the telemeter. Thus only one delivery pressure will be operative at any one time. The 1.750-g.p.m. pump will be removed from the plant after the close of the exposition.

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Bureau of Reclamation Construction Program Largest in its History

PROGRESS of the largest construction program in the history of the U. S. Bureau of Reclamation is told in a section of the annual report of the Secretary of the Interior for the fiscal year ended June 30, 1937. During the year, six major dams were begun, bringing the total number of dams under construction to 21, and Pine View Dam, Ogden River project, Utah, was completed and placed in service.

Grand Coulee Dam, 550 ft. in height and containing 11,250,000 cu.yd. of concrete, was the outstanding project under construction by the Bureau during the last fiscal year. It is estimated that the completed dam and appurtenant works will cost $119,000,000; the power plant $67,000,000, and the irrigation system $208,000,000. The construction contract for the foundation was 54 per cent completed at the beginning of the fiscal year and 82 per cent at the close. During the year more than 2,000,000 cu.yd. of concrete were placed, a record of 13,002 cu.yd. being made on June 24. The foundation section is scheduled to be completed about the middle of the fiscal year 1938, progress during the year being many months ahead of schedule. An average of 6,000 men was employed at the site of construction during the year.

Construction work was in progress on 35 projects in 13 states. The bureau constructed 249 miles of canal; 134 miles of drains; 14 tunnels of a total length of 49,000 ft.; 222 miles of road; 2.4 miles of railroad; 35 miles of transmission line; 4.739 canal structures; 383 bridges; 851 culverts; 46 miles of pipe, and 192 flumes. Excavations consisted of 43,858,000 cu.yd. of earth and rock.

According to the report, the operations of the Bureau of Reclamation over a period of 35 years have resulted in the construction of 138 storage and diversion dams; 21 power houses; 2,344 buildings; 19,116 miles of canals, ditches and drains; 72½ miles of tunnels; 4,367 miles of telephone lines; 267 miles of dikes and levees; 6,041 flumes; 18.694 culverts; 13,166 bridges; and 182.964 other irrigation structures.

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Large City Park Valuation More Than Billion

THE VALUE of park properties in cities of 500,000 or more population in the United States exceeds that of any other type of municipally owned property, according to a study of municipal and county parks recently completed by the National Park Service and the National Recreation Association.

Five hundred and ninety-two cities estimated their 238.524.4 acres of parks to be worth $1.178.922.000. New York, Philadelphia, San Francisco, Buffalo, and several other large cities furnished no estimates. In many smaller cities the value of park properties is exceeded only by the investment in the public school plant, the report states.

Worn Pavement Topped and Widened

Indiana modernizing operation shows variety of tasks facing engineer who revamps old roads to meet present day requirements

Salvaging existing pavement, that has worn out under modern traffic or has become inadequate to carry heavy loads, by resurfacing it with new materials is becoming general practice. The individual job however, still presents engineering and construction features which are building up a valuable knowledge of practices followed in this type of highway work. One such job is the resurfacing and widening of Route 2 from Elkhart to Goshen, Ind.

The work consisted of widening the existing 18 ft. road to 30 ft. by a new 12-ft. slab 9 in. thick at the edge thinned to 7 in. 2 ft. from the edge: resurfacing the full 30 ft. with a minimum 5-in. slab of reinforced concrete; and building sections of new 9:7:9-in. reinforced-concrete pavement where relocation was deemed advisable. About 2.3 mi. are old brick, 1.6 mi. old concrete and 2.6 mi. new concrete. Construction operations were practically identical on pavement laid over brick, over concrete and new pavement, except that separation sheets of tar paper were placed between the old brick and new concrete. No separation sheets were placed between old and new concrete.

A minimum 5-in. slab over the old surface was specified. To insure this minimum thickness the old surface was cross-sectioned and critical grades were established. Levels were taken every 25 ft. longitudinally and at 2-ft. intervals at these stations laterally. Readings were also taken at high points between stations, and the highest point in the 18x25-ft. section was established as the critical grade for that section. High points in successive sections were plotted and a grade established for the pavement surface. From these critical grades sideforms were set. Variations in sideform elevations of more than 0.01 ft. from critical grade were corrected by pulling the sideform pins and resetting the forms.

The separation sheets used on the old brick pavement were of tar paper from 36 to 48 in. wide, weighing not less than 40 lb. per 1,000 sq.ft. After

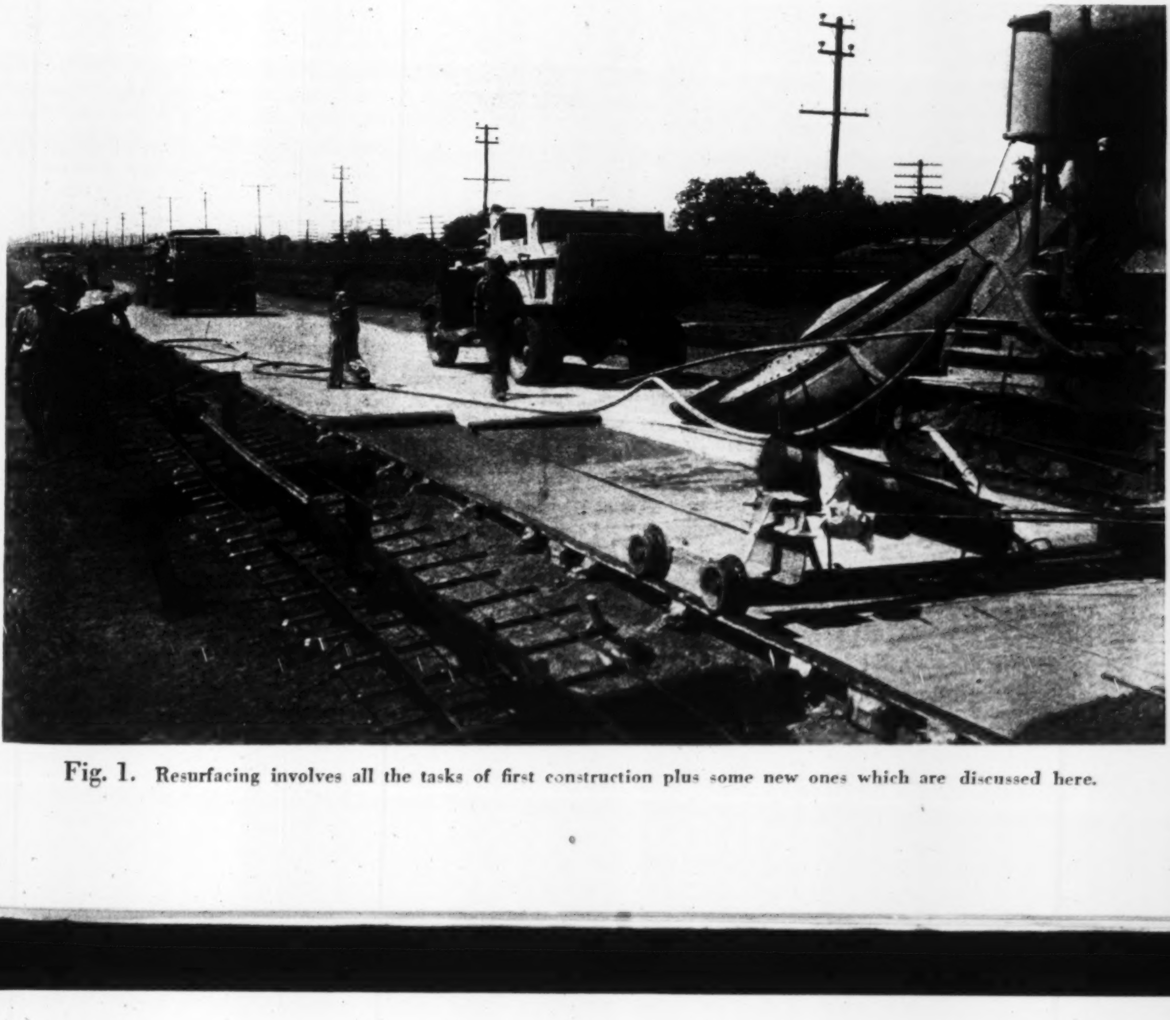

Fig. 1. Resurfacing involves all the tasks of first construction plus some new ones which are discussed here.

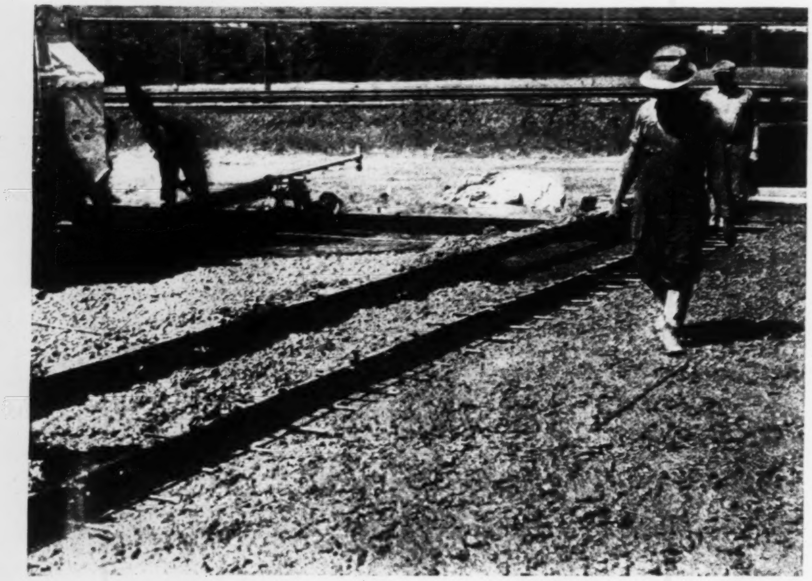

Fig. 2. Expansion joints are carefully designed and placed in new resurfacing slabs

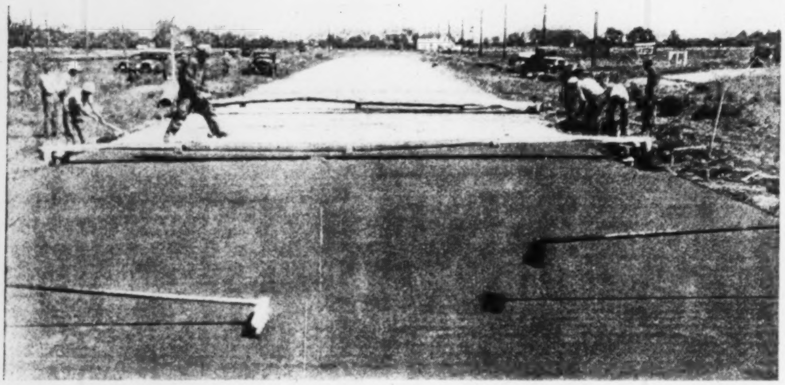

Fig. 3. Finishing the new slab involves every precaution to preserve a surface accuracy of $\frac{1}{8}$ in. in 10 ft.

the brick surface was wetted, the tar paper was laid with a 1-in. lap and the resurfacing concrete was placed directly on the paper. In unrolling the paper care had to be taken to maintain the proper lap and to keep the paper from folding over irregularities in the surface. When concrete was placed upon the paper special care was essential to avoid wrinkling, thereby setting up planes of weakness in the concrete slab.

Design to specifications

All concrete, both that in the resurfacing slab and that in the new sections, was designed to standard Indiana specifications. The proportions for each batch were: Cement, 620 lb.; sand, 1,320 lb.; small gravel, 1,386 lb., and large gravel, 994 lb. The cement factor was held constant at 1.5 bbl. per cu.yd. of concrete, the water ratio varying between 27 and 31 gal. per 6-bag batch. A maximum slump of 3 in. was permitted. All materials were proportioned at a central batching plant located about midway in the work and were trucked to the mixer in 3-batch trucks.

The concrete was placed the full 30-ft. width. It was first struck off 2 in. below the finished surface, wire-fabric reinforcing was placed and the slab was brought to finished grade and struck off again. Following the final strikeoff came a double-screed finishing machine. The pavement was then flex-planed, this machine substituting for a second finisher or a second passage of one finisher. The surface was then floated with a longitudinal float, the operators working from a double bridge. From the back of this bridge the alignment of expansion joints was checked. Surface irregularities were then checked with long-handled straightedges, the operators working from both sides of the pavement. Some difficulty was encountered at first in securing a satisfactory finish in the center of the pavement with the 10-ft. straightedges but this difficulty was overcome by hand floating the center from a bridge after straightedging. A non-skid surface texture was secured by brooming. The pavement was cured first with burlap, which was left on for a maximum of 24 hr., then with wet straw. There was little variation from this procedure in resurfacing either brick or concrete. New construction followed standard practice.

When the concrete was hard enough to support a man's weight it was inspected for surface irregularities. Variations greater than $\frac{1}{8}$ in. as revealed with a 10-ft. straightedge, were rubbed down with a handstone while the concrete was still green. If the irregularity could not be eliminated before hardening the spot was marked and the high point taken down with a power grinding machine.

Expansion joints

Transverse expansion joints were spaced 40 ft. apart. Where the bottom of the expansion joint rested on the subgrade it was copper sealed, the seal extending into the surface of the brick only an inch. The expansion joints are of $\frac{1}{2}$-in. preformed rubber and are doweled with capped and greased $\frac{5}{8}$-in. dowels 2 ft. long, spaced 12 in. on centers. No transverse contraction joints were used. Longitudinal dummy joints of $\frac{1}{4}$x2-in. premolded bituminous strips were set into the concrete by machine 10 ft. from each edge of the finished pavement.

This resurfacing was done with the expectation that ultimately the road will be widened to 40 ft. The crown of the 30-ft. section, therefore, is graduated from 3 in. on one side to $\frac{3}{4}$ in. on the other. The work was done by the Indiana State Highway Department of which M. R. Keefe is chief engineer, with Ralph Pinnick, resident engineer, in direct charge. The contractor was the Grace Construction & Supply Co. of Fort Wayne, Ind.

Salvage From Sewage?

by WILLEM RUDOLFS

Chief, New Jersey Sewage Experiment Station, New Brunswick, N. J.

Is it practicable and should sewage researchers change their attitude toward disposal to emphasize possibilities of by-product recovery?

SEWAGE TREATMENT has been increasing rapidly in this country during the last few years. With the aid of federal funds alone over 700 projects to provide for sewage treatment, with an expenditure of over $200,000,000, have been completed or are in process of completion. Thus far the practice has been to destroy as far as possible the organic wastes present in sewage. More and better methods have been evolved for the oxidation of soluble, semi-soluble and part of the suspended organic substances. And radical improvements for the destruction of organic and putrescible solids have been accomplished.

Any thoughts or methods for the utilization of by-products, however, have been incidental. To be sure, more and more emphasis has been placed on the utilization of combustible gases and there is more talk about the use of sludge as fertilizer; but the demand for the return of plant food values to the soil is stronger from the layman than from the sanitary expert.

There is a trend toward utilization which is perhaps greater than generally realized. Should the practice of getting rid of liquid community waste be modified to include utilization of by-products? Should we look forward to changed conditions and determine which products could be economically salvaged or produced? In an attempt to answer these questions we must logically consider first the extent of the present utilization of by-products and then determine the possibilities of producing others.

Present uses

A summary of present uses includes the following:

Gas—The combustible gases produced by bacterial action, to the extent of about 0.8 cu.ft. per person a day from suspended solids separated from sewage, are used for heat and power in treatment plants in this country, and sometimes sold or used in part for vehicle propulsion abroad. The use of gas is now well recognized, but only during the last few years has it come into general practice.

Sludge—The settled solids, the residue after digestion or the sludge from oxidation devices, are mainly discarded as fill and placed on grass and around shrubbery at the treatment works. A small portion is used for 'humus" or fertilizer in gardens, lawns, etc. and sold for general agricultural use.

Land Use—Spreading of sewage on land has never been of widespread importance in this country. Abroad, a number of large cities use this method, although the practice has been gradually declining for a number of obvious reasons.

Ash—Ash from incinerated solids has been used in a few instances for road making and has been proposed for cement mixtures.

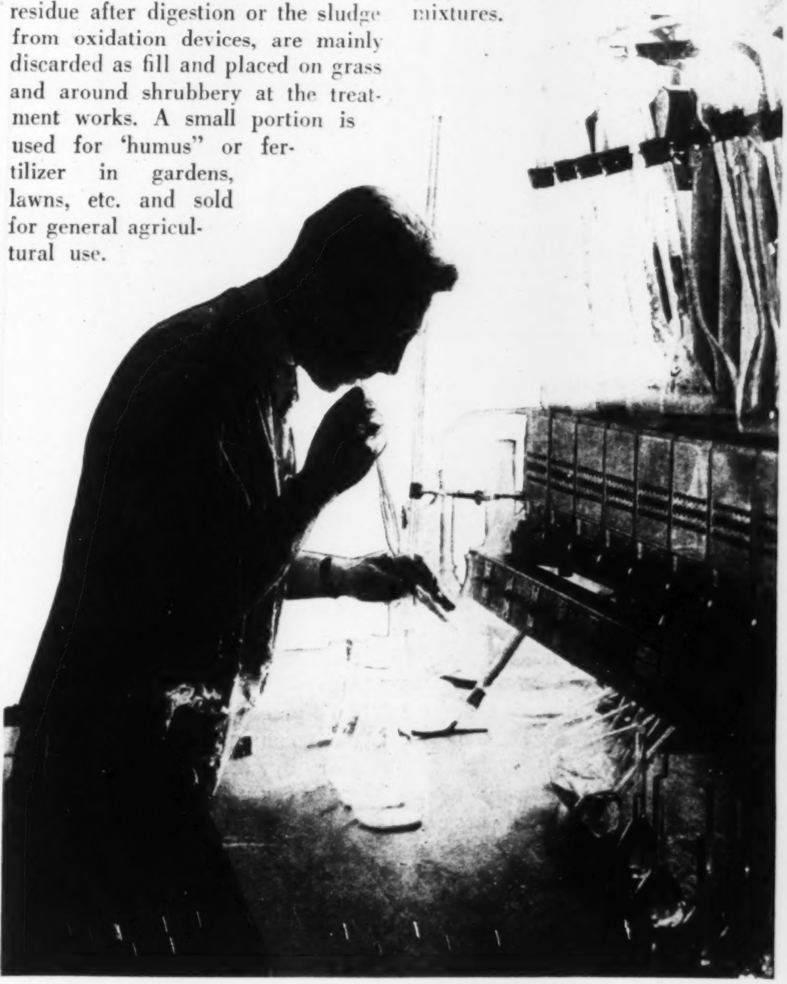

Fig. 1. **Research workers are exploring the possibilities of valuable by-product recovery from sewage. Their findings may revolutionize future treatment practice.**

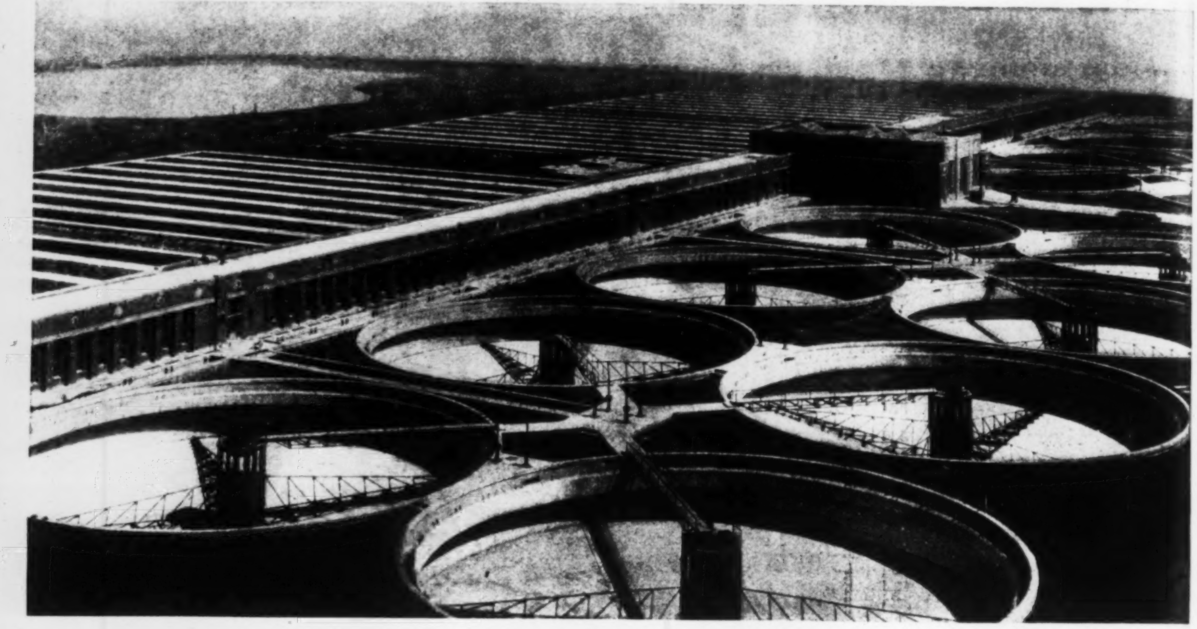

Fig. 2. **Operation of a disposal plant with its complicated structures and equipment costs money. Some day, however, plants like the new Easterly Works at Cleveland may pay their way from salvageable constituents in sewage.**

Fish and Fowl—There are a few places abroad where sewage treatment has become incidental to fish culture. Large quantities of carp, some perch and eel are propagated for market distribution. Fish specialists are required to observe certain precautions in order to prevent disease dissemination. In connection with some sewage fish ponds, duck farms are conducted.

Irrigation and Re-use—In dry climates and sandy areas the use of treated sewage for irrigation purposes has been well developed. Re-use of water for industrial purpose is practiced where the water supply is deficient.

Grease—Fats and soaps present in large quantities in sewage and sludge have been removed successfully. The use of such grease, however, is limited. Where gas can be used to advantage or sold, digestion and gas recovery appears to be the more economical scheme.

Ammonia—The recovery of ammonia from the liquid has been demonstrated to be feasible even with a weak sewage.

Coagulant Recovery—In treatment processes where chemicals are used certain coagulants may be recovered. There are a few places where from 60 to 80 per cent of the coagulant applied is recovered and used again.

Beautification—Highly treated effluents are used in some places where water is scarce for supplying ponds, lakes, waterfalls, and lawn sprinklers in city parks. The application of the idea could probably be greatly widened. Such an arrangement might lead to the construction of disposal plants near the center of the community, and further the conversion of certain blighted areas to parks.

Possible uses

Off-hand it would seem that by-product utilization from sewage has been developed wherever warranted. There are, however, many possible extensions of present use as well as further development of new products, quite likely based on the modification of treatment methods.

Fertilizer—Conservative estimates have placed the loss of nitrogen in this country at some 200,000 tons a year by discharging sewage into water courses and through waste of sludge. Fresh and activated sludges, for instances, have nitrogen contents varying from 4 to 7 per cent on a dry basis; in the digestion process some nitrogen is lost, but the remainder averages 2 to 3 per cent.

The soil building quality of sludge, however, is perhaps as important as its nitrogen content. While few municipalities can afford to advertise and sell this material in competition with fertilizer manufacturers, the latter are potential buyers of "humus" for use as a filler material. Sand, soil and peat have heretofore been used for fillers—the possibility of conditioning sludge for this purpose by certain manufacturers is by no means remote.

Alcohol—It has been shown that sewage sludge as well as garbage can be utilized for the production of industrial alcohol. Fermentation and dry distillation are the methods most frequently mentioned.

Acetone—Under certain biological conditions considerable quantities of acetone can be produced from fresh sewage sludge. This is a question of cultivating the proper bacteria and making their environmental conditions suitable for increased activity.

Organic Acids—Under ordinary conditions of sludge digestion fatty and amino-acids are first produced but as the process proceeds they are rapidly destroyed. Under "natural" conditions (without seeding) the amounts of these acids increase or at least accumulate. Biological changes are possible to produce larger quantities of acid and possibly some of the rarer amino-acids.

Growth Promoting Substances—It is a well recognized fact (the importance of which is not generally realized) that sewage and sludge used as fertilizers cannot be judged by their nitrogen and "humus" content alone. These materials produce better results than ordinary chemical analyses would lead one to expect. Organic growth-promoting substances are undoubtedly present in sewage and sludge, and, under suitable conditions, it may be possible to increase the yield and extraction of such substances.

Hydrogen—Depending upon conditions maintained during digestion the hydrogen content of the gases produced can be varied. Stimulation of hydrogen production with suitable organisms is possible.

Carbon—Large quantities of activated carbon are produced from industrial wastes. Production of activated carbon from sludge is also feasible. At present some "organic base exchange materials" are recovered by charring sludge.

Insecticides—The liquid distillate obtained from carbonization of sludge is said to be a fairly efficient insecticide, non-injurious to plants.

Is recovery practical?

The list of possible by-products might be extended even without material changes in the present methods, such as the recovery of chemical compounds from methane and the production of numerous pure substances. At present gross biological processes are used to destroy or stabilize. The possibility of using different cultures or organisms by stimulation or changing environmental conditions is almost unlimited, because sewage contains a complex variety of materials.

It should be clearly understood, however, that by-product recovery, aside from gas utilization and some fertilizer production, is still in the laboratory realm of research. Present knowledge has not advanced to the point where it is possible to show practical application of the ideas set forth. Nevertheless, enough is known to challenge research workers to intensify exploratory work. But until such findings have received the closest scrutiny and approval of the profession and have undergone rigid plant-scale tests, municipalities must view with caution any schemes set forth by over-enthusiastic and sometimes unscrupulous promoters.

A change in outlook

The point to be stressed is that change in outlook is desirable. With the increased demand for cleaner streams sewage treatment processes necessarily become more complex and more costly. The greatly accelerated loss of soil fertility by cropping, erosion and other factors brings increasing demands to return as much as possible of the food values to the soil. Production of pure chemical substances other than those needed for agricultural purposes is perhaps farther in the future.

Has the time come to conserve and utilize more of the by-products and should the sanitary engineering profession search for methods to accomplish it? Undoubtedly considerable research is required on certain phases of this question before the value of a change in methods can be determined. A search for methods of utilization might result in entirely new procedures in treatment, or conceivably make sewage disposal incidental to the production of by-products. We have examples of similar changes in other industries.

However, even if we agree that the time has come to change our outlook this should not mean that continued perfection of present methods should stop. New developments come slowly, and long-range research projects must be carefully planned if proper progress is to be made. Before the beacons are changed we must be sure of the course. Nevertheless the writer believes that the time has come to change at least our habit of thinking from destruction of waste to conservation and recovery.

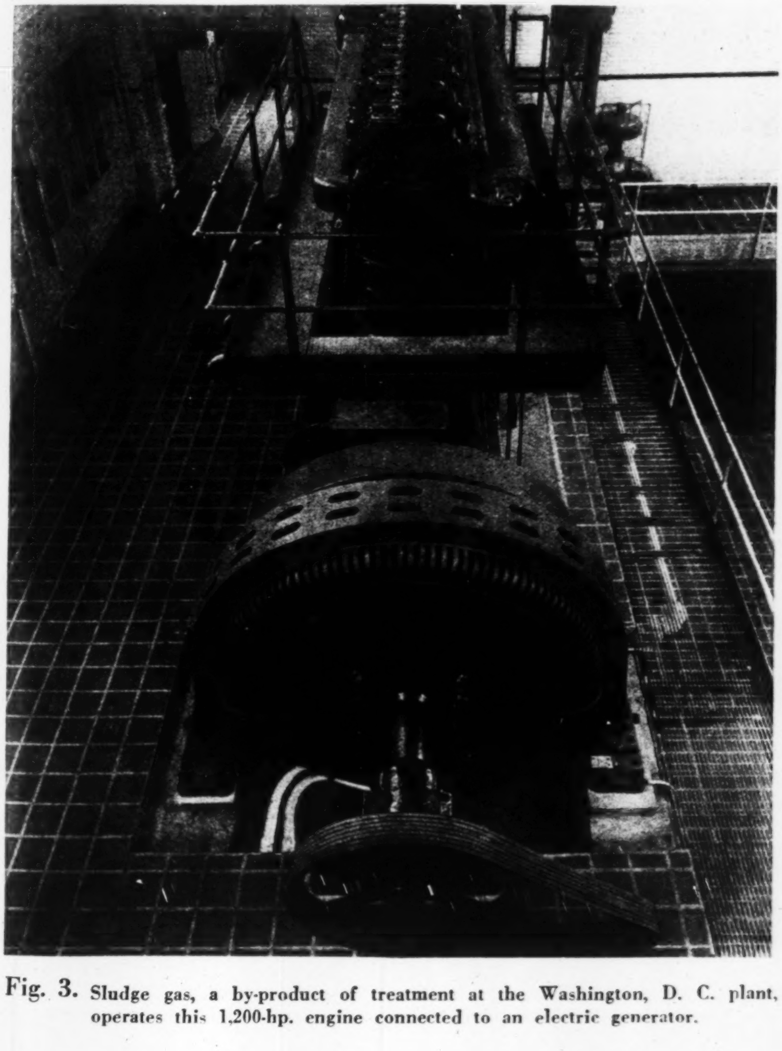

Fig. 3. **Sludge gas, a by-product of treatment at the Washington, D. C. plant, operates this 1,200-hp. engine connected to an electric generator.**

New Rock Drill Dust Control

System of adequate ventilation at face of heading and wet drilling developed by New York contractors as answer to drill-dust control problem

LACKING FAITH in vacuum exhaust methods and believing that wet drilling with adequate ventilation is the best means of suppressing rock-drill dust for the prevention of silicosis, a group of contractors in the New York area, under the direction of a consulting mining engineer, have developed a dust control system involving wet drilling principles. The system was designed to meet requirements of the New York state silicosis law calling for approved dust control methods on every rock drilling job within the state. So far this method has not been approved, in fact, the State Department of Labor and Industry, charged with the administration of the silicosis act, has only recently tested the apparatus.

First unit in use

The first unit of the new dust control system has been put in service in the Park Contracting Corp. section of the Sixth Ave. subway at 35th St. The apparatus consists of a drill carriage mounting six pneumatic-feed drifter drills which are arranged in three pairs at the front of the jumbo: two at the top above the deck, two at the center, and two at the bottom. Running along both sides of the deck and the lower frame of the jumbo are four 10-in. steel ventilating pipes, extending forward into the working zone of the drill operators, and all coming together at the rear of the carriage into a 20-in. manifold (Fig. 1). This manifold is connected to a 20-in. steel vent pipe by means of a non-collapsible flexible canvas tubing (Fig. 2).

Ventilation is supplied by a centrifuge fan of special design with a capacity of 10,000 cu. ft. of air per min., located well back in the workings on the floor of the cut (Fig. 3). At the inlet of the fan is a 1-in. water connection feeding about 5 gal. of water per min. into the centrifuge. The water mixes with the incoming air and traps the dust. Water and dust together are thrown off the fan blades at high speed into a side ring, passing off into a drain, while the effluent air shoots up an exhaust pipe to the street surface. Though the fan has a capacity of 10,000 cu. ft. of air per min., the contractors find that 4,800 cu. ft. pulled through the vent pipes is sufficient when six drills are operating.

This system provides true wet drilling and ample ventilation at the face of the heading, for the air is exhausted from the working zone of the drill runners. No draft is created at the face, and the heading is remarkably clear. Even the usual fog created by wet drilling is absent. The drill design permits only water, and no air, to pass through the hollow drill steel. Water at the rate of 2 gal. per min. is applied to each drill at 40-lb. pressure.

Dust samples and counts made under the supervision of Dr. Frederick B. Flinn, of the School of Public Health, Columbia University, show that the system reduces the dust content in the air well below the safe hygienic limits. For example, tests made Oct. 25 show the following results (Greenberg-Smith impinger): Bottom front of jumbo, 4.35 million particles (under 10 microns) per cu. ft. of air; top front of jumbo, 3.35 million particles; rear of carriage, 4.5 million particles. Ten million particles is the safe limit established by the New York code. No test of the exhaust air has been made by the official impinger sampling device because this type of dust counter is not adaptable to high-velocity air streams. However, grab samples taken with a konimeter show the dust content in the effluent air to be extremely low.

This method of dust control was developed by the contractors after studies to determine the best manner to promote the protective intent of the new silicosis law. Although realizing that millions of dollars had been spent in South Africa and elsewhere during the past 30 years in the effort to prevent silicosis, and that their own investigation would be expensive, this group in the General Contractors Association of New York generously contributed their time and money and permitted interference with the orderly conduct of their work to determine the best means under varying circumstances to protect the workmen from hazards of drill dust.

The contractors first tested under actual working conditions the three vacuum dust hood devices that have been approved by the state. These devices have been described in previous issues of *Engineering News-Record*. Those engaged in heavy rock work feared that the idealized tests made on single drills for approval purposes did not fully indicate that the devices would work satisfactorily when operated by workmen under varying conditions, especially in view of the auxilliary equipment that must be carefully tended. Such equipment was intended and approved for dry drilling, with air fed through the hollow drill steel forcing out the cuttings and dust.

These contractors hold that dry drilling invites a serious dust hazard in case of failure of the vacuum devices to function properly or improper use by the workmen. They point out that it would be impracticable to supply the number of trained technicians for each dust control unit as had been associated with the former tests, and furthermore contend that the vacuum devices are not sufficiently foolproof for the usual working personnel to operate.

Since vacuum dust hood systems had often received inventive atten-

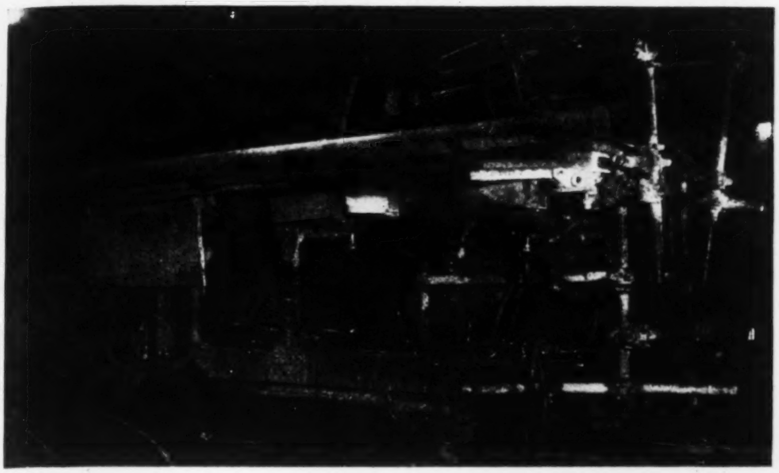

Fig. 1. First unit built to prove contractors' theory of adequate drill dust control through wet drilling and face ventilation. Jumbo carries six wet drifters and four 10-in. vent pipes extending into drill operating zone.

tion subsequent to U. S. Patent 796,-327, issued to Martin Hardsocg in 1905, and yet had not been adopted in any mining district in the world, the contractors suspected that they were impractical and ineffective under productive conditions. However, recent strong claims by manufacturers of such devices for not only dust prevention efficiency but also in operating economies indicated that these devices should be given a working test with both sinker and drifter types of drills under wet and dry drilling conditions.

Some of these tests have already been made; their dust count results appear in Table I. In observing these test runs the contractors came to the following conclusions: That extraordinary supervision is needed to keep the equipment in proper operation and use; that dust is liable to escape into the breathing zone of the workmen when the blow valve is used on the drill; an excessive cushion of dust and cuttings is frequently left in the holes to be blown out in preparation for loading; when drilling in wet rock the steel is likely to stick in the hole.

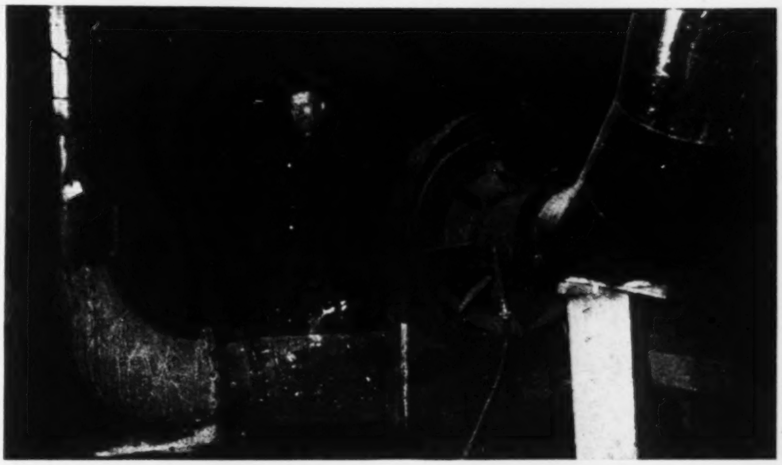

Fig. 3. Power plant of the ventilating system is a centrifuge fan into which water is injected to trap the dust in exhaust air.

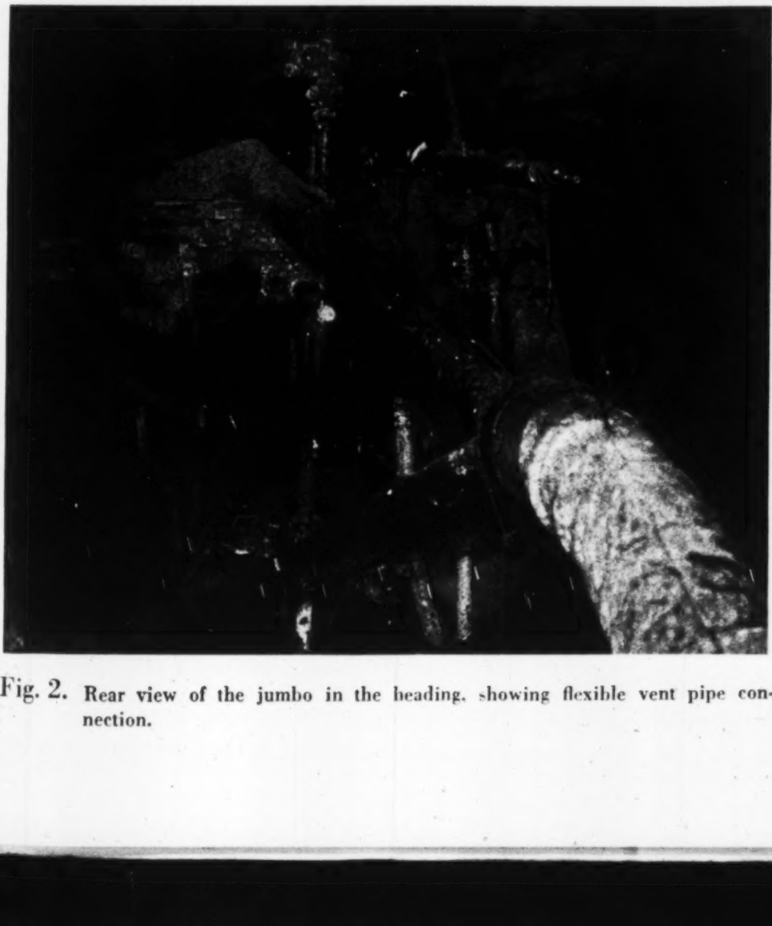

Fig. 2. Rear view of the jumbo in the heading, showing flexible vent pipe connection.

Other objections include: possibility of cuttings clogging the suction hose; difficulty in collaring the holes; the practice of using hose without hoods in close quarters, thus permitting some dust to escape. They report that in one tunnel test under dry drilling with eight drifters mounted on a jumbo and using dust hoods, the manipulation of the vacuum apparatus so delayed progress that 11 hr. was required to drill out the round as compared with 5½ hr. by wet drilling in the same heading. Wet drilling coupled with ventilation has been the only method of dust control accepted by foreign mining countries, such as Canada, Australia, South Africa and by other states in this country, and although mentioned

TABLE I—DUST COUNTS UNDER VARIOUS CONTROL METHODS

Date (1937)	Conditions	Dust Count*
	Park Contracting Corp. Subway	
Oct. 21	Six drifters on jumbo, tunnel method under decking, drilling wet, 10,000 c.f.m. air exhausted at face:	
	Driller's station, bottom front	9.29
	Driller's station, top front	4.23
	To rear of jumbo	4.17
	Same with 0.01 per cent wetting agent added to water:	
	Driller's station, bottom front	3.43
	Driller's station, top front	1.96
	To rear of jumbo	3.76
	Same with 0.001 per cent wetting agent added to water:	
	Driller's station, bottom front	6.48
	Driller's station, top front	4.89
	To rear of jumbo	2.91
Oct. 25	Six drifters on jumbo, drilling wet, 4,800 c.m.f air exhausted at face:	
	Driller's station, bottom front	4.35
	Driller's station, top front	3.35
	To rear of jumbo	4.50
Dec. 7	Six drifters on jumbo in cut drift, drilling wet, 1.45 g.p.m. water per drill through steel, 4,630 c.f.m. air exhausted at face.	
	General air near jumbo	3.59
	Bottom left front of jumbo	4.04
	Same, second test	4.19
	Top of cut bench	2.98
	Same, second test	3.27
	Bottom middle front of jumbo	2.38
	Same, second test	2.45
	To rear of jumbo 20 ft	2.08
	Another test, front middle of jumbo	5.17
Dec. 10	Six drifters on jumbo, drilling wet, 1.67 g.p.m. water through steel, 4,555 c.f.m air exhausted at face.	
	Middle bottom front of jumbo	2.33
	Same, second test	1.91
	Same, third test	2.23
	To rear of jumbo 28 ft	2.50
	Carleton Co., Inc., Subway	
Oct. 14	Bench under decking, 1 jackhammer drilling dry, second drill for 3 of 15-min. test, exhaust hoods:	
	Near drill runner	13.39
	25 ft. from drill	11.64
	Geo. H. Flinn Corp. Subway	
Oct. 13	2 jackhammers, drilling wet, no exhaust hoods.	6.43
	Same, exhaust hoods in use	4.00
	Same, sample taken 20 ft. from drills	2.13
Oct. 26	El. col. pit, 5 dry jackhammers, exhaust hoods in use, during test first one and then two drills stopped	13.70
	A. A. Johnson & Necaro Co., Inc., Subway	
Oct. 16	1 to 2 jackhammers drilling wet under decking	7.16
	1 to 3 jackhammers drilling wet under decking	7.16
Oct. 26	2 jackhammers drilling wet under decking	5.00
	Same in another location	2.08
	Spencer, White & Prentis, Inc., Subway	
Oct. 15	3 jackhammers drilling wet in shaft, natural ventilation into existing subway	2.04
	Walsh Const. Co., Queens Midtown Tunnel, E. 42 St.	
Oct. 15	5 jackhammers, drilling wet, shaft, nat, vent.	5.87
	Same, 12 ft. from drills	3.06
Oct. 16	3 dry jackhammers, exhaust hoods in use, 2 drills stopped during part of test	8.94
Oct. 20	8 wet drifters on jumbo, nat. vent., 6 drills half of test:	
	Center front of jumbo	8.97
	Top front of jumbo	10.28
	18 ft. from drills	4.21
Oct. 25	4 dry jackhammers, exhaust hoods in use, spasmodic drilling	6.89
	Same, 15 ft. from drills	11.69
Oct. 28	8 dry drifters on jumbo, exhaust hoods in use:	
	Bottom front of jumbo	21.73
	Same, 4 drills running, top front	7.96
	Same, 4 drills running, bottom front	10.12

* Dust counts are in million particles (under 10 microns) per cu. ft. of air, impinger samples.

TABLE II—CHARACTERISTICS OF PROPOSED PORTABLE FAN AND FILTER UNIT

Centrifuge size	12W	16W	20W
Dia. inlet, in.	12	16	20
Cap. fan, c.f.m.	4,400	8,000	11,000
Tot. pressure, in water...	4	3	5
Fan r.p.m....	1,900	1,450	1,150
Motor r.p.m..	1,750	1,750	1,750
Fan h.p.	10	20	25
Overall length	9'	8'	10'
Overall width	4'8"	5'6"	7'8"
Height above truck	4'6"	6'	6'6"
No. filter units	6	10	12
Est. cost, exc. truck	$1,250	$1,800	$2,300

Note: When exhausting into long vent pipe capacity would be reduced to 2,500, 5,000 and 6,000 c.f.m., resp. Drill capacities: 12W, 5 drifters; 16W, 11 or 12 drifters; 20W, 15 or 16 drifters.

in the New York state code, no approval has been issued for such methods by state officials.

Certain parties are reported to have raised the pneumonia bugaboo in connection with wet drilling, purporting to quote a bulletin of the U. S. Bureau of Mines as evidence. The contractors find that the bureau denies any such statement or implication, referring to Technical Paper 260 as follows: "You will note that while reference is made to pneumonia in the Butte mines, the reason for pneumonia is not wet drilling, but rather because of transition from extremely hot to cold air with clothing saturated with perspiration."

Inquiry by the contractors of several mining centers failed to reveal any medical authority who attributes pneumonia to wet drilling. A Canadian mining association reports: "I cannot give you any actual demonstration that no pneumonia or other health hazard is associated with wet drilling, but certainly there is nothing in our experience which would indicate the existence of any such hazard. Our doctor is in constant touch with the camp doctors, and it has never occurred to any of them that there was any health hazard associated with wet drilling. Our doctor believes there is less pneumonia among the miners than among the general population, and there is not the slightest evidence of wet drilling being responsible for any health hazard."

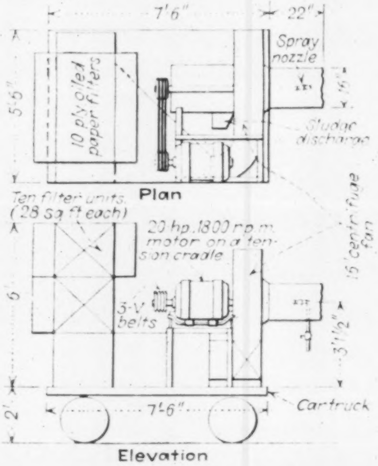

Fig. 4. Sketch of proposed portable fan and filter unit designed to exhaust ventilation air directly into heading. Unit will ride on separate carriage behind jumbo.

A Canadian mining company answers: "As to the view held in New York that the use of water should be prohibited, our experience and practice is directly opposed to this. We encourage the copious use of water in all dusty operations and believe it is the best and most effective single factor readily available for use in keeping down dust."

From a Montana mining company: "There has been no increase in pneumonia or kindred diseases since the adoption of wet drilling in the mines of Butte in 1917. The Butte Anti-Tuberculosis Society and the State Tuberculosis Sanitarium report no new cases of silicosis contracted in the Butte mines since the adoption of wet drilling in 1917."

An official of a large concern with mines in Mexico and the Lake Superior district replies: "No increase in pneumonia or rheumatism among miners in Mexican or cold Lake Superior districts since the adoption of water for dust control. Periodic X-ray examinations and dust sampling at working faces indicate the ventilation, spraying of muck, controlled blasting and wet drilling definitely reduce incidence of silicosis. The compensation to silicotics required by Mexican law running lower each year since we started using water and ventilation. All drilling of whatever nature is with water. Experience in trapping dust in mine proves it is not as satisfactory as laying dust with water."

This group of contractors realizes the necessity of certain standards to be followed for the successful operation of wet drilling and ventilation as a dust control measure. Therefore they have urged the approval of the following amendment to the New York code:

1. In class I rock (less than 10 per cent free silica) any standard wet drill and natural ventilation.
2. For open and open-cut work in Class II rock (more than 10 per cent free silica) any standard wet drill and natural ventilation.
3. For tunnel work and work in such confined spaces as to be closely bounded on all sides, wet type sinkers or blockholers of bores not exceeding 2⅝ in., drilling down, ¾ to 1 gal. of water per min. should flow through the drill steel and 500 cu. ft. of air per min. per drill should be exhausted from the drilling location; with wet type drifters having bores not exceeding 3½ in. the water through the drill steel should be 1½ to 2 g.p.m. and 1,000 c.f.m. air per drill should be exhausted from the heading; with 4-in. bore drifters the ventilation air should be increased to 1,250 c.f.m. per drill. Where a plurality of drills are used at a location, the compressor capacity multiples should be used in determining the amount of ventilation air, e.g.: 1.8 for two drills, 3.4 for four drills, 4.8 for six drills, 6.1 for eight drills, 7.3 for ten drills.
4. All holes should be started (collared) wet.
5. Few holes as possible should be drilled at an upward inclination; all others should incline downwards.
6. The construction of the drills should be such that air is not blown through the drill steel when the throttle valve is moved between closed and full running position, and a minimum amount of air should be permitted to pass through the hollow drill steel.
7. When local conditions, such as a preponderance of up holes or the frequent blowing of the holes, require additional ventilation, a sufficient amount should be provided to keep the dust count within the statutory limit to ten million particles per cu. ft. of air.

At a hearing conducted on Dec. 17 by Commissioner Elmer F. Andrews, of the state labor department, a code to permit wet drilling with ventilation was introduced by the seven manufacturers of wet drills, based on experiments conducted at the experimental mine of the Ingersoll-Rand Co. at Totts Gap, Pa., by the industrial hygiene division of the state labor department. This code differs materially from that proposed above, particularly in the amount of air to be exhausted by ventilation. The commissioner appointed an advisory committee to study the code and report at a later hearing.

Encouraged by the apparent success of their system as tried out on the Park Contracting Corp. job, the contractors are going ahead with further developments. The next installation will be a portable rig for the Spencer, White and Prentis, Inc., section of the Sixth Ave. subway. This unit, as shown in Fig. 4, will mount the suction fan centrifuge on a carriage to the rear of the drill jumbo, discharging the exhaust air into the heading, and to make sure that any dust getting through the water trap in the fan is not discharged into the general atmosphere, the exhaust air will pass through a series of oiled filter papers. Plans are now being worked out to use the portable unit as an aid in removing the smoke and gases of blasting. This scheme contemplates discharge of the polluted air into vent pipe leading to the surface. Estimated costs of the portable unit are given in Table II.

For locations where a drill carriage cannot be used, such as blockholing, trimming and otherwise isolated drilling jobs, the contractors feel that wet drills alone will provide ample dust control. Test results, listed in Table I, seem to bear out this contention.

The development work has been under the direction of Benjamin F. Tillson, consulting mining engineer of Montclair, N. J. The contractor group involved consist of the following firms: Dravo Contracting Corp., Geo. H. Flinn Corp., A. A. Johnson & Necaro Co., Inc., The Carleton Co., Inc., Mason & Hanger Co., Park Contracting Corp., Rosoff-Brader Construction Corp., Spencer, White & Prentis, Inc., and Walsh Construction Co., Inc. Fred W. Stiefel, chief engineer of the Park and Rosoff-Brader companies and special representative of the contractor group, has been largely responsible for the speedy success of the development work.

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Many Water Problems Extend Beyond Drainage Basins

THAT many problems connected with water control or use cannot be adequately dealt with by study of integral drainage areas is brought out in a recent bulletin of the Division of State Planning, State of New York (Bulletin 29, "A Preliminary Survey of the Water Resources of New York", by E. S. Cullings, water resources consultant). The Bulletin says, "Such problems as flood control, flow regulation and abatement of pollution must consider a drainage basin as a whole, regardless of state or local political boundaries. But there are other regional problems, such as those connected with the canal system, the New York City water supply and the Adirondacks and Catskills recreation areas, which have little relation to watershed limits".

Water supply problems that cut across drainage areas include those of New York City, of the lower Hudson River valley, and of the district along the southerly shore of Lake Ontario between the Oswego and Niagara Rivers; in the latter the streams are badly polluted while the groundwaters are hard and often contain sulphur, so that a supply of adequate quality and amount may have to be obtained from Lake Erie or from the highland to the south, through a water district. In respect to floods, the zoning of flood plains and relocation of occupants of flood areas involve state policy and action. The state canal system, whose channels have a total length of 525 miles, cuts across many drainage areas, which thus cannot be dealt with independently. Also the principal highland recreation areas of the state overlap several drainage areas, and as the full development of these areas depend largely on water, joint consideration of several basins is necessary in proper planning for these areas.

BOOK NOTES AND REVIEWS

The month's additions to the engineer's reading and reference list

The Significance of Bridges

BRIDGES IN HISTORY AND LEGEND —By Wilbur J. Watson and Sara Ruth Watson. 248 pp. Published by J. H. Jansen, Caxton Bldg., Cleveland, Ohio. Price $3.50.

The epic significance of bridges, quite as much as their technical development, should be a part of the knowledge of every civil engineer. In this book, a scholarly bridge engineer cooperating with his equally scholarly wife and utilizing the artistic talents of a gifted daughter, has collected many of the legendary and historical references to bridges that abound in literature. Classification of the references under such groupings as rainbow bridges, devil's bridges, peace bridges, covered bridges, etc., provides a unique organization of the text matter. As William E. Wickenden writes in an introduction: "Craftsmanship, science, the art of design, human aspiration, social utility and striving after beauty, as expressed by the builders of bridges, are in this book fused into one."

British Roads

ROADMAKERS LIBRARY—Vol. I, Road Making and Administration ($9); Vol. II, The Testing of Bituminous Mixtures ($5.50); Vol. III, Road Aggregates ($8); Vol. V, Asphalt Roads ($9); Vol. VI, Principles of Road Engineering ($18.50). Published by Edward Arnold & Co., London, and Longmans, Green & Co., New York.

The ambition of these English and American publishers to produce a library of books on modern roadbuilding all of reasonably-current publication date deserves the appreciation of all interested in highway engineering literature. Up to the present, five of the six volumes published have been received for review and they make an impressive showing in volume and substance. All are treatises on English practice; as the general editor Percy Edwin Spielmann states, they undertake to answer the question: "How are things done in Great Britain—and why?" But the insularity is not narrow, a surprising range of American design and research practice is covered.

Interest is also broadened by the fact that all the elemental questions of traffic volume, classification, speed and safety and their implications in design of line, profile and roadway dimensions and surfaces are the pressing highway problems in Great Britain as in the United States and are being as intensively studied there as they are here. In comparing British engineering thought on these fundamental questions with our own, American highway students will find plenty for consideration. It is regrettable that price places the books out of reach of many who could profit by reading them.

The text of the series as set forth in the statement quoted is closely adhered to in the several volumes published. Under its title of Road Making and Administration, Volume I enumerates and describes British resources in legislation, administrative boards, educational facilities and research laboratories and in materials and machinery for roadbuilding. The text is notably complete and strong in the discussion of tar and asphalt road materials, practices and construction equipment. This leaning of practice toward bituminous types in English roadbuilding is further emphasized in Volume II which is a laboratory handbook on the Testing of Bituminous Mixtures.

Volume III, Road Aggregates, discusses the uses and testing of aggregates used in highway construction. No review copy of Vol. IV, Highway and Road Traffic Laws, has been received as no effort is being made to obtain distribution in this country because the book relates to local British regulations.

Volume V, Asphalt Roads, is an extension of the discussion of asphalt and bituminous roads and testing contained in the first two volumes.

Volume VI the largest of the three, on Principles of Road Engineering, contains perhaps the most for American engineers as it centers on common problems. Its twenty chapters discuss traffic handling and economics; route-location surveys and plans; design of line, profile, roadway and intersections; design and construction of earthworks, foundations, drainage and surfaces, and include sections on streets, foot and cycle paths and road lighting, marking and signalling.

NEW PUBLICATIONS

SEGMENTAL FUNCTIONS — TEXT AND TABLES. By C. K. Smoley. 184 pp. Published by C. K. Smoley & Sons, Scranton, Pa. Price $5.

CIVIL ENGINEERING DESIGN TYPES AND DEVICES—Third Edition. By Thomas W. Barber. 254 pp. Published by The Technical Press, Ltd., 5 Ave Maria Lane, Ludgate Hill, E. C. 4, London. Price 12/6d.

AN INDEX TO BUSINESS INDICES—By Donald H. Davenport and Frances V. Scott. 187 pp. Published by Business Publications Co., Chicago. Price $3.

KEMPE'S ENGINEER'S YEAR-BOOK –1938—Forty-fourth edition. Revised and edited under the direction of the editor of "The Engineer". 2816 pp. Published by Morgan Brothers, Ltd., 28 Essex St., Strand, London W. C. 2. Price 31/6d.

AMERICAN ROAD BUILDERS' ASSOCIATION — Convention Proceedings, 1937. Editor-in-Chief, Charles M. Upham. 827 pp. Published by the American Road Builders' Association, National Press Bldg., Washington. Price $10.

A HUNDRED YEARS OF MECHANICAL ENGINEERING — By Edward Cressy. 340 pp. Published by the Macmillan Co., New York. Price $4.25

HOUSING AND TOWN PLANNING — LECTURES, 1936-1937. By Sir Raymond Unwin. 86 pp. Published by the Central Housing Committee, Washington, D. C.

REFRIGERATION AND AIR-CONDITIONING INSTITUTE — FOURTH ANNUAL REPORT. Prepared by members of the institute. 14 sections. Published by Refrigeration and Air-Conditioning Institute, Chicago. Limited circulation.

THE TRANE AIR CONDITIONING MANUAL — By William Goodman. 7 chapters. Published by The Trane Co., La Crosse, Wis. Price $5.

MECHANICAL WORLD YEAR BOOK–1938—210 pp. Fifty-first edition. Published by Emmott & Co., Ltd., 31 King Street West, Manchester 3, England. Price 1/6 net.

Formulas and Tables for Computing Cylinder Intersections

By Louis J. Sack
Assistant Engineer, Board of Water Supply, New York, N. Y.

Simple expressions developed for the volume common to intersecting cylinders under various conditions

Computing the volume at the intersection of cylinders is a problem that frequently arises; as for example, excavation, masonry, waterways, etc., work, call for this volume when the intersection of circular shaft and tunnel of the same or different diameters occurs, the volume at the groin of two intersecting circular arches is desired, or in the case of tees and wyes. While these problems can, in general, be treated mathematically, the solutions are not always simple, occasionally requiring the use of tabulated values of special functions, and in other cases being too cumbersome for practical application.

Mathematical solutions of some of the more common cases arising in practice are given here, and tabulated values for computation to a high degree of accuracy with a minimum amount of labor are derived. The general method used in the solution of all these problems is to compute the volume of each cylinder. There is then a volume which has been included twice in the total quantity; this volume is to be deducted from the total volume. The object of the mathematical discussion is to derive an expression for this common volume.

The intersection of cylinders of the same diameter—The common volume of two cylinders whose axes intersect at right angles will be derived here. Fig. 1-A represents this intersection referred to three rectangular axes OX, OY and OZ. The equations of the two cylinders are, respectively:

$$x^2+y^2=a^2 \text{ and } x^2+z^2=a^2$$

The element of the common volume formed by the intersection is represented by

$$dV=yzdx=(a^2-x^2)\,dx$$

The total volume is obtained by integrating the above expression between limits *o* and *a*

$$V=8\int_0^a (a^2-x^2)\,dx=8\left(a^2x-\frac{x^3}{3}\right)\Big|_o^a=\frac{16}{3}a^3$$

If the axes of the two cylinders intersect at any angle ϕ less than 90 degrees, the expression for the common volume is

$$V=\frac{16}{3}\,\frac{a^3}{\sin\phi}$$

The intersection of cylinders of different diameters—Let the radii of the two cylinders be *a* and *b*, *a* being greater than *b* and *k* being equal to the ratio $\frac{b}{a}$. The axes of the two cylinders intersect at right angles. Fig. 1-B represents this intersection referred to three rectangular axes *OX*, *OY* and *OZ*. Let the *Y*-axis be that of the larger cylinder and the *Z*-axis be that of the smaller. The equations of the cylinders are, respectively:

$$x^2+y^2=b^2 \text{ and } x^2+z^2=a^2$$

The element of the common volume is represented by

$$dV=zydx=\sqrt{(a^2-x^2)\,(b^2-x^2)}\,dx$$

The total common volume is

$$V=8\int_0^b \sqrt{(a^2-x^2)\,(b^2-x^2)}\,dx$$

This expression cannot be integrated in terms of the elementary functions. It is known as an elliptic integral and, when integrated in terms of the elliptic functions, it leads to the expression

$$V=\frac{8}{3}a\left[(a^2+b^2)\,E-(a^2-b^2)\,K\right] \quad (A)$$

where *K* and *E* are known as the complete elliptic integrals of the first and second kinds, respectively.

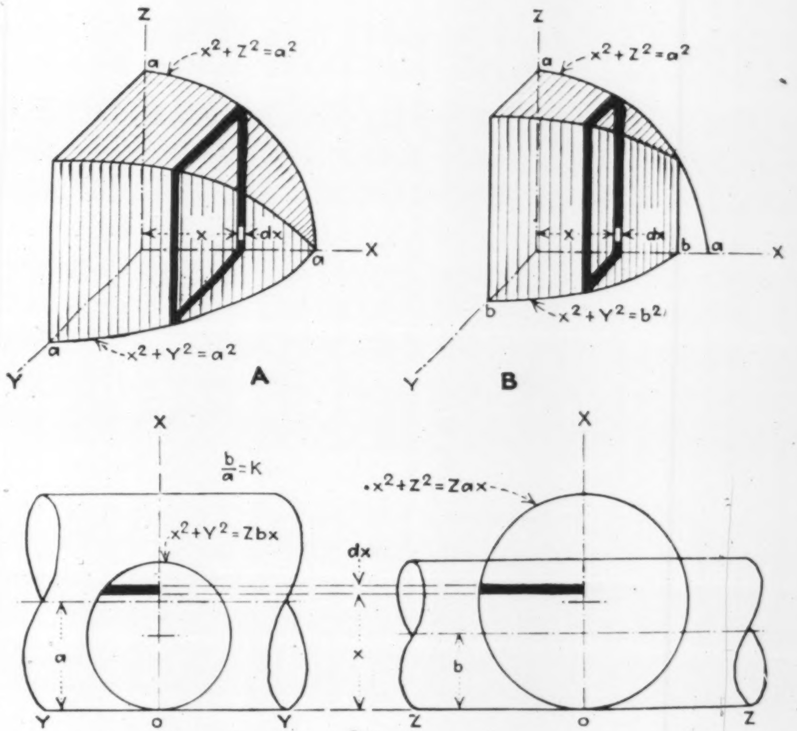

Fig. 1. **Intersection situations treated in the text. (A) Intersection of cylinders of equal diameters. (B) Intersection of cylinders of unequal diameter. (C) Intersection of cylinders—diameters unequal and inverts in same plane.**

$$K = \int_0^1 \frac{dx}{\sqrt{(1-x^2)\ (1-k^2x^2)}} \text{ and}$$

$$E = \int^1 \frac{\sqrt{1-k^2x^2}}{\sqrt{1-x^2}}\, dx$$

The expressions for *K* and *E* can be evaluated by expanding the integrands in a series and integrating the latter term by term. The values of *K* and *E* were computed in this manner and tabulated for various angles whose sine is *k*, where $k = b/a$. A four-place table is given in "A Short Table of Integrals" by B. O. Peirce, p. 121. These tables are not always at hand and do not admit of a direct application. The accompanying Table I was derived from a five-place table of values of *K* and *E* and is very simple in its application. In order to use it, the expression for the volume is rewritten, remembering that $k = b/a$,

$$V = \frac{8}{3} ab^2 \left[(K+E) - \frac{(K-E)}{k_2} \right] = \frac{8}{3} ab^2\, C \text{ (B)}$$

When $k = 1$, or the cylinders are of equal radii, the constant $C = 2$ and the expression for the common volume is $\frac{16}{3}\ a^3$. the same as derived previously.

Values for *C* in equation (B) are given in Table I. For any other value of *k*, value of *C* can be interpolated with a maximum error of less than 0.2 per cent. As an illustrative example, computations are shown for a vertical circular shaft of 16 ft. diameter which is intersected by a horizontal circular tunnel of 17 ft. diameter. Here $a = 8.5$ ft., $b = 8.0$ ft., $k = 0.94118$, $\sin^{-1} k = 70° 15'$, $E = 1.11618$, $K = 2.51592$, $C = 2.05450$

Substituting in formula (A) Volume = 2976.66 cu.ft.

Substituting in formula (B) Volume = 2980.39 cu.ft., an error of 0.13 per cent.

TABLE I — Common Volume of Intersecting Cylinders of Different Diameters

To obtain volume multiply $\frac{8}{3} ab^2$ by *C*

$k = b/a$	C	$k = b/a$	C
0.1	2.34760	0.75	2.18242
0.2	2.34284	0.8	2.14826
0.3	2.32878	0.85	2.11749
0.4	2.30818	0.9	2.08327
0.5	2.28005	0.95	2.04834
0.6	2.24466	1.0	2.00000
0.7	2.20119		

TABLE II — Common Volume of Intersecting Cylinders of Different Diameters with Inverts on Same Horizontal Plane

To obtain volume multiply $\frac{8}{3} ab^2$ by *C*

$k = b/a$	C	$k = b/a$	C
0.1	0.98248	0.75	2.06964
0.2	1.34637	0.8	2.07631
0.3	1.59400	0.85	2.07393
0.4	1.77434	0.9	2.06176
0.5	1.90600	0.95	2.03835
0.6	1.99789	1.0	2.00000
0.7	2.05428		

The intersection of two cylinders of unequal radii with their inverts on same horizontal plane—This problem arises often in practice, as in the case of a drift branching off from the main tunnel line or an eccentric spur from a main pipe line. Fig. 1-C represents this intersection referred to three rectangular axes OX, OY and OZ. Let *a* be the diameter of the main line and *b* the diameter of the branch, *b* being smaller than *a* and $k = b/a$. The equations of the main line and branch are respectively:

$$x^2 + z^2 = 2ax \text{ and } x^2 + y^2 = 2bx$$

The element of the common volume formed by the intersection is

$$dV = yzdx = x\sqrt{(2b-x)\ (2a-x)}\, dx$$

The total common volume is

$$V = 4\int_0^{2b} x \sqrt{(2b-x)\ (2a-x)}\, dx$$

$$= \frac{8}{3}\sqrt{ab}\,\frac{3a^2-2ab+3b^2}{2} -$$

$$2\,(a+b)\,(a-b)^2 \log_e \frac{\sqrt{a}+\sqrt{b}}{\sqrt{a}-\sqrt{b}})$$

the last part of the second term representing natural logarithms. If common logarithms are used, it is to be multiplied by 2.30258+.

Table II will enable one to determine the volume without use of logarithmic tables. It is based on the value of *k*, which is the ratio of *b* to *a*. For this purpose the expression is reduced to the following form, using *k* for *b/a* and common logarithms.

$$V = \frac{8}{3} ab^2 \left[\frac{\sqrt{k}\,(3-2k+3k^2)}{2k^2} \right.$$

$$\left. -1.726939\,\frac{(1+k)\,(1-k)^2}{k^2} \log \frac{1+\sqrt{k}}{1-\sqrt{k}} \right]$$

$$= \frac{8}{3} ab^2\, C$$

It is seen from Table II that when $k = 1$, the two cylinders being of the same diameter, the expression for common volume reduces to

$$V = \frac{16}{3} ab^2 = \frac{16}{3} a^3$$

and is identical with the formula derived in case I, thus affording a check on the accuracy of the work.

As an example of the accuracy of the table for interpolation, take the case of a tunnel 17 ft. in diameter and a drift 11 ft. in diameter, branching off at right angles.

Here $a = 8.5$ ft. $b = 5.5$ ft. $k = \frac{5.5}{8.5} = 0.6470$

and $C = 2.02443$

$$V = \frac{8}{3} \times 8.5 \times 5.5^2 \times 2.02443 =$$
$$1388.08 \text{ cu. ft.}$$

By using the formula directly, the volume is 1391.02 cu.ft., a variation of 0.14 per cent.

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Heavy Water in Lake Mead

Temperature studies in Lake Mead have thrown light on the curious phenomena of muddy water near the bottom with clear water above. The result of monthly temperature readings at different levels, as reported in "The Reclamation Era" for September, show temperatures near the bottom abnormally high instead of the usual minimum. It is believed that inflowing waters heavy with silt content and of slightly different specific gravity tends to retain their identity and move through the reservoir near the bottom.

Temperature measurements were begun in June, 1936. At first the usual conditions obtained, that is, temperatures were lower at the bottom and higher at the surface. The range at that time was from 50 deg. F. to 76 deg. F. Later, water temperature on the bottom increased from the original 50 to 64 deg., and at 9 ft. above the bottom was 68 deg. This reading remained practically constant to a height of 34 ft. and then began a decrease, reaching 60 deg. at a height of 59 ft. This temperature remained constant from that level to the surface. Samples taken just above the strata of unusually high temperature were entirely clear but those taken within the warmer zone "contained so much silt that they had the color and consistency of thick chocolate". Laboratory analyses (at temperatures of 74 to 78 deg. F.) showed specific gravity of the clear water to be 1.0014 and of the silty water, 1.1787.

THE WEEK'S EVENTS

(Continued from page 1006)

OBITUARY

Francis D. Henley, 63, right-of-way engineer for the Virginia state highway department, died Dec. 10 in Richmond. Mr. Henley, who had been connected with the highway department for 30 years, was a graduate of William and Mary College.

Richard F. Hoffmark, general manager of the Wood Bros. Construction Co. of Lincoln, Neb., died there Nov. 29 at the age of 54. Mr. Hoffmark was formerly vice-president of the A. Guthrie Construction Co. of Portland, and while connected with that concern he supervised the construction of the Cascade tunnel. After his graduation from Purdue University in 1906, Mr. Hoffmark worked on the Panama Canal. He joined the Guthrie company in 1913 and remained with the firm until 1932.

Albert R. Schefpo, engineer of design of the Cook County highway department at Chicago, died recently at the age of 53. Mr. Schefpo, who graduated from the University of Michigan as a civil engineer in 1909, had been connected with the Crooks County department since 1916.

Warren B. Keith, who retired in 1930 after 20 years' service as a civil engineer on the staff of the New York, New Haven & Hartford R.R., died in Braintree, Mass., Dec. 15 at the age of 80. A graduate of Amherst College, Mr. Keith began his engineering work in 1883 on the staff of the New England R.R., later engaged in engineering work in the Middle West, and joined the N.Y.N.H. & H. R.R. in 1910.

Charles F. McCabe, 50, civil engineer of Hollis, L. I., N. Y., died Dec. 17 at Ridgewood, N. Y.

George W. Donaghey, twice governor of Arkansas and active as a contractor in that state, died Dec. 14 in Little Rock at the age of 81.

Fred H. Frailey, for 19 years didivision engineer for the Santa Fe R.R., died in Oklahoma City Dec. 13 at the age of 58. Mr. Frailey's home was in Arkansas City, Kan.

Adam M. Ganson, who was for many years superintendent of construction for the George A. Fuller Co. of New York and Boston, died in Petersham, Mass., Dec. 14 at the age of 75. Mr. Ganson was connected with the construction of many important buildings, including the Flatiron Building, the Pennsylvania Terminal, and the New York Post Office in New York City.

John M. O'Donnell, who retired in 1927 from the civil engineering staff of the Louisville & Nashville R.R., died in Louisville Dec. 6 at the age of 72. Mr. O'Donnell was a graduate of Eminence College. He was on the staff of the city of Louisville until about 1902 when he joined the L. & N. R.R.

George Woolley, head of the bulkhead and jetty building firm of George Wooley & Sons, died in Long Branch, N. J., Dec. 8 at the age of 68.

Eugene W. Boxley, a railroad contractor connected with the J. J. Boxley Construction Co., died recently in Columbus at the age of 59. Mr. Boxley was in charge of a contracting force which built the Norfolk & Western Ry. between Kenova, W. Va., and Naugatuck in 1903 and 1904.

Harry Conrad, who was city engineer of Wheeling, W. Va., for 12 years was killed in an automobile accident Dec. 8 at the age of 53.

William J. Harahan, president of the Chesapeake & Ohio Ry., died in Clifton Forge, Va., Dec. 14 at the age of 69. Mr. Harahan was also president of the Pere Marquette and Nickle Plate Railroads. Mr. Harahan began his railroad work 56 years ago as a clerk in the office of the superintendent of the Louisville & Nashville. Entering the engineering department of the line five years later, he became assistant division engineer. In 1889 he went to the Chesapeake & Ohio as division engineer. After several years in that position and a year as engineer of structures on the Baltimore & Ohio he joined the staff of the Illinois Central Railroad. He remained with the Illinois Central for 15 years, rising through various ranks to the position of vice-president. In 1907 he left the Illinois Central to become assistant to the president of the Erie R.R. and in 1912 he became president of the Seaboard Air-line Ry. After eight years in that position he became president of the Chesapeake & Ohio in 1920. In 1929 he relinquished the presidency and became senior vice-president, but resumed his former post in 1935.

PERSONAL

Henry C. Laub has been appointed county engineer of Cass County, Iowa, to succeed Darrell N. Blake, recently resigned.

W. G. Sloan of the Denver office of the Bureau of Reclamation, has been appointed engineer in charge of a survey of the proposed Cabinet Gorge dam project on the Clark Fork River in Idaho.

Elmer E. Barnard, consulting sanitary engineer of Lynchburg, Va., has moved his offices to the Lynch Building.

John J. Egan, Buffalo civil engineer and a graduate of the University of Nebraska, has been appointed budget director in the city government there.

Louis A. Harding, president of Harding-Carlton, Inc., of Buffalo, N. Y., has been appointed commissioner of public works in that city.

Samuel Shulitz, assistant professor of mechanics and hydraulics at the Colorado School of Mines, has been appointed engineer to a special advisory committee on federal soil conservation research. Professor Shulitz has done hydraulic research for the Bureau of Reclamation in Denver and for the U. S. Engineer Corps at the Vicksburg Hydraulic Laboratory.

George M. Taylor, for many years assistant district engineer of the Southern Pacific Railroad at Klamath Falls, Ore., has been named engineer of that district.

George H. Ritchie, who has been assistant superintendent and chief engineer of the transportation department of the Tennessee Coal, Iron & R.R. Co., has been named superintendent of that department.

Oliver R. McIlhenny has been appointed assistant superintendent and chief engineer of the transportation department of the Tennessee Coal, Iron & R.R. Co., succeeding Mr. Ritchie.

James E. Walters, construction superintendent at Pickwick Landing Dam for the TVA, has been appointed to the same position at Hiwassee Dam.

M. M. Mason has been appointed acting construction superintendent for TVA at Pickwick Landing Dam.

H. R. Hooper has been promoted from Grade 3 engineer to assistant engineer of distribution for the Ottawa, Ont. water department.

CALENDAR OF MEETINGS

NATIONAL SOCIETIES

National Paving Brick Association, annual meeting, Netherlands Plaza Hotel, Cincinnati, Jan. 12-14.

American Engineering Council, annual convention, Washington, D. C., Mayflower Hotel, Jan. 13-15.

Secretaries of Engineering Organizations, annual conference, Washington, D. C., Mayflower Hotel, Jan. 13-15.

Associated Equipment Distributors, annual meeting, Cleveland, Jan. 15-16.

American Road Builders Association, road show and convention, Cleveland, Jan. 17-21.

American Wood Preservers Association, annual meeting, Chicago, Congress Hotel, Jan. 18-20.

American Wood Preservers Association, annual convention, Congress Hotel, Chicago, Jan. 18-20.

American Society of Civil Engineers, annual meeting, New York City, Jan. 19-21.

National Rivers and Harbors Congress, 33rd convention, Mayflower Hotel, Washington, D. C., Jan. 20-21.

Purdue Road School, annual school and road show, Purdue University, Lafayette, Ind., Jan. 24-28.

Engineering Institute of Canada, annual meeting, London, Ont., Jan. 31-Feb. 1.

American Concrete Contractors Association, National Concrete Masonry Association, National Cinder Concrete Products Association, Cast Stone Institute, joint convention, Hotel Sherman and Medinah Athletic Club, Chicago, Feb. 7-11.

Associated General Contractors of America, annual convention, Willard Hotel, Washington, D. C., Feb. 8-10.

American Institute of Mining and Metallurgical Engineers, annual meeting, Engineering Societies Building, New York City, Feb. 14-18.

Association of Highway Officials of North Atlantic States, annual convention, Hotel Ambassador, Atlantic City, N. J., Feb. 16-18.

REGIONAL AND LOCAL

Louisiana Engineering Society, annual meeting, St. Charles Hotel, New Orleans, Jan. 7-8.

South Carolina Society of Engineers, annual meeting, Columbia Hotel, Columbia, Jan. 7.

Illinois Contractors Association, annual meeting, Jefferson Hotel, Peoria, Ill., Jan. 11-12.

University of Colorado, Highway Engineering Conference, Boulder, Colo., Jan. 13-14.

New Jersey Association of Professional Engineers and Land Surveyors, Elks Club, Jersey City, N. J., Jan. 14-15.

New York State Sewage Works Association, annual meeting, New York City, Jan. 20-22.

North Carolina Society of Engineers, annual meeting, Raleigh, Jan. 28-29.

Southwest Road Show and School, annual session, Wichita Exhibition Building, Wichita, Kan., Feb. 22-25.

Elections and Activities

Resolutions voicing disapproval of President Roosevelt's proposal to reduce the amount of federal-aid road funds were adopted by the newly organized Indiana Society of Professional Engineers at its December meeting. The society went on record as favoring the President's intention of balancing the budget but held that funds collected from automotive taxes should be applied exclusively to the improvement of highways.

Membership of two standing committees of the Ohio Society of Professional Engineers was announced recently. Members of the committee on public relations are: R. N. Waid, L. A. Boulay, H. E. Calvin, George W. Clark, W. H. Dittoe, G. W. Emery, S. S. Evans, Waldo Hartline, A. S. Porter, J. E. Root, T. J. Small and Noah B. Truax. Members of the committee on professional practice are: C. S. Finkbeiner, F. J. Cellarius, Guy W. Ellis, L. T. Fawcett, Frank Frazier, Frank Tolles, H. E. Nold and Walter Willard.

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License Examinations

New York: Examinations for professional engineers at New York, Albany, Syracuse and Buffalo, Feb. 1-3. Examinations for land surveying, Feb. 4.

Rudy Arnold Phot

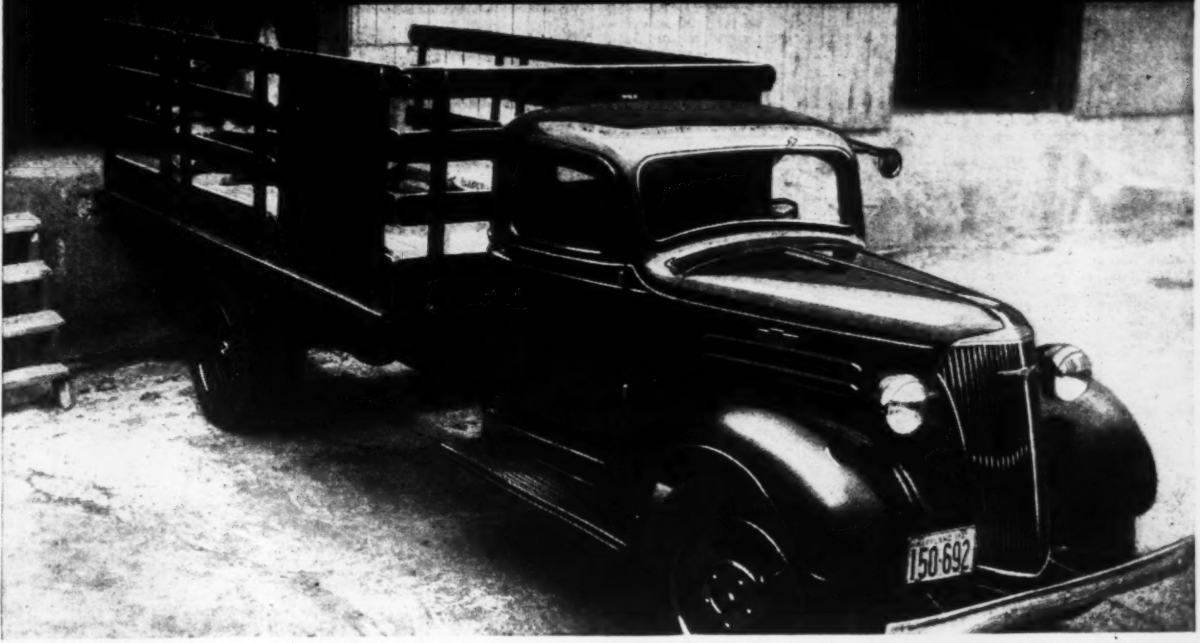
BUILDING FOR A WORLD'S FAIR

Against a background of New York skyscrapers five miles to the west, buildings for the 1939 New York World's Fair rise on the reclaimed Flushing Meadows in the borough of Queens.

In the foreground, the buildings from left to right will house exhibits on production, welfare, and community interests. In the background, from left to right, are buildings for business administration and communication. Behind the communications building is the domed administration building.

The circular foundation at left center is for the theme building, a 700-ft. obelisk and a 200-ft. sphere. Flushing Creek, in the foreground, is dammed by tide gates just out of the picture at the right. These keep salt water and control the flow of the stream so that it may be used for two artificial lakes of 19 and 35 acres, respectively.

CHEVROLET TRUCKS



Contractors and Builders are reducing their haulage costs with famous Chevrolet economy—with bigger load space—and with the greatest pulling power of any truck in the lowest-price field. Chevrolet Trucks are the only low-priced trucks that offer all of the important features listed below. Ask your Chevrolet dealer for a demonstration.

General Motors Installment Plan—monthly payments to suit your purse.

CHEVROLET MOTOR DIVISION
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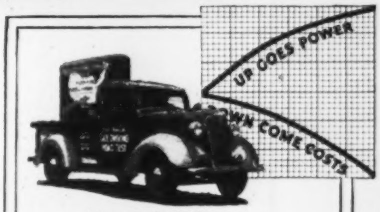
DETROIT, MICHIGAN



Unmatched Economy
Proved in 10,244-Mile

"RIM OF THE NATION" TEST RUN

With Half-Ton "Economy Model" Pickup—1,000-Pound Load.

Location of Test	'Round the Nation, Detroit to Detroit
Distance Traveled	10,244.8 Miles
Gasoline Used	493.8 Gallons
Oil Consumed	7.5 Quarts
Water Used	1 Quart
Gasoline Cost	$101.00
Gasoline Mileage	20.74 Miles per Gallon
Average Speed	31.18 Miles per Hour
Running Time	328 Hours, 31 Minutes
Gasoline Cost per Mile	$.0098
Average Oil Mileage	1,365.9 Miles per Qt.
Total Cost of Repair Parts	$0.73

These records have been certified by the A.A.A. Contest Board as being officially correct.

AAA

PERFECTED HYDRAULIC BRAKES—NEW HIGH-COMPRESSION VALVE-IN-HEAD ENGINE—MORE LOAD SPACE—IMPROVED LOAD DISTRIBUTION—IMPROVED FULL-FLOATING REAR AXLE WITH NEW ONE-PIECE HOUSING (on 1½-Ton Models)—NEW ALL-STEEL CAB—PRESSURE STREAM LUBRICATION

"MORE POWER *per gallon* CHEVROLET **LOWER COST** *per load***"**

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents

LUMBER AND LABOR contribute the principal price changes for this month. The lumber prices are mixed, down at Atlanta, Birmingham, Cleveland, Dallas, Detroit, Kansas City, New York and St. Louis and higher in Chicago and Baltimore.

Increases in common labor are reported in Boston, Cincinnati, Los Angeles, Minneapolis and Pittsburgh; in the rate for bricklayers, an increase in Pittsburgh and a decrease in Kansas City; for carpenters increases in Birmingham and Pittsburgh. The structural ironworker's rate increased at Chicag neapolis, New York and Pittsburgh.

Expanded metal lath prices are higher in Baltimore and Cleveland; she is up in St. Louis. Vitrified sewer pipe is higher in Boston, Detroit and Concrete sewer pipe also rose in Boston. Paint prices dropped in Bo Cleveland and rose in Detroit, Kansas City and New York. Roofing are higher in Birmingham and Cleveland.

CEMENT, AGGREGATES, READY-MIXED CONCRETE—F.O.B. CITY

	PORTLAND CEMENT Per bbl., carload lots, including 40c per bbl. for bags, cash discount not included			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE Ready Mixed 1:2:4, 50 more, delivered
	Cloth Bags	Paper Bags	Bulk	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	
Atlanta	$2.83	$2.58	$2.50	$1.65	$1.65	$1.55	$1.65	$1.75	$1.65	$1.75	$8.90
Baltimore	2.31	2.06	1.86	1.80‡	1.80‡	1.30‡	1.80‡	1.80‡	1.80	1.80	7.35
Birmingham	2.40	2.15	1.95	1.80	1.80	1.45	1.00	1.00	.90	1.15	5.45
Boston	2.25*b*	2.00*b*	1.80*b*	1.20	1.20	.85	1.20	1.20	....	....	7.0
Chicago	2.45	2.20	2.05	1.00	1.00	1.00	1.32	1.32	1.00	1.00	....
Cincinnati	2.53	2.28	2.08	1.20	1.20	1.30	1.80	1.80	....	....	6.60
Cleveland	2.45	2.20	....	1.40	1.40	1.30	1.60	1.60	1.65	1.65	7.40
Dallas	2.30	2.05	1.85	1.40	1.40	1.05	1.00	1.15	1.84	1.89	7.00
Denver	3.08	2.85	....	1.20	1.40	.90	....	....	....	....	....
Detroit	2.25	2.00	1.80	1.30	1.30	1.20	1.50	1.60	1.20‡	1.30‡	5.50
Kansas City	2.55	2.30	2.06	1.85	2.30	1.15	1.85	1.80	....	....	7.65
Los Angeles	2.32	2.12	....	1.20	1.20	.90	1.20	1.20	1.05*f*	1.05*f*	6.83
Minneapolis	2.80	....	2.40	1.00*h*	1.00*h*	.25*h*	1.00*h*	1.00*h*	....	....	7.15
Montreal	....	....	1.70*c*	.80	.85	1.15	1.20‡	1.30‡	....	....	6.50
New Orleans	2.37	2.12	2.05	1.50	1.50	1.25	....	....	....	....	8.00
New York	2.50‡	2.20‡	....	1.10*de*	1.10*de*	.70*de*	1.65*de*	1.75*de*	....	....	7.70
Philadelphia	2.55	2.30	2.10	1.45‡	1.55‡	1.15‡	2.00‡	2.05‡	1.00‡	1.00‡	8.00
Pittsburgh	2.40	2.15	1.95	1.80‡	1.80‡	2.10‡	2.25‡	2.25‡	1.50	1.50	8.75
St. Louis	2.52	2.27	....	1.40‡	1.40‡	1.40‡	.85*h*	.85*h*	.65/.95*g*	.50/.85*g*	7.50
San Francisco	2.72	2.52	2.20	1.35	1.35	1.35	1.50	1.50	....	....	7.50
Seattle	2.95	2.70	....	1.33	1.33	1.33	2.25	2.25	....	....	7.50

‡ Delivered. CEMENT: *a* 10c. allowed for each returnable bag. *b* 10c. per bbl. off for cash. *c* Sales tax included. AGGREGATES: *d* Per cu.yd. *e* Barge lots alongside docks. *f* Crushed granite. *g* F.o.b. granite City, Ill. *h* F.o.b. plant. CONCRETE: *i* Within three miles of Public Square. *j* 5% discount for *k* Discount 35c. 500 to 2000; 70c. 2000 to 5000; 95c. over 5000. *l* Up to 200 cu.yd. *m* 50c. off for cash.

CASH DISCOUNTS, CEMENT to Contractors: truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash 10c. per bbl. for payment within 15 days of date of invoice.

CURRENT MAXIMUM PRICES RECEIVED AT CEMENT MILL

Charge for bags not included. For cloth bags, add 40c. per bbl.; 10c. refund allowed for each returnable bag; for paper bags add 15c. per bbl., not refund

	Bagged	Bulk		Bagged	Bulk		Bagged
Buffington, Ind	$1.70	$1.65	Ironton, Ohio	$1.50	$1.45	Northampton, Pa.	$1.65
Crestmore, Calif	1.72	....	Iola, Kans.	1.70	1.65	North Birmingham, Ala	1.75
Dallas, Tex. (Inc. 5c. tax)	1.80	1.75	La Salle, Ill.	1.70	1.65	Richard City, Tenn	1.85
Hannibal, Mo	1.70	1.65	Limedale, Ind	1.70	1.65	Steelton, Minn	1.80
Hudson, N. Y	1.75	1.70	Mason City, Ia.	1.70	1.65	Universal, Pa	1.65
Independence, Kans	1.70	1.65	Norfolk, Va.	1.70	1.65	Waco, Tex. (Plus 5c. Tax in Texas)	1.75

LOWER PENINSULA, MICHIGAN. Uniform carload lot cement price established March, 1937.

PAVING BRICK, BLOCKS, ASPHALT, ROAD OILS—F.O.B. CITY

	PAVING BRICKS AND BLOCKS			PAVING ASPHALT Per ton, less than 80 penetration,		ASPHALT BINDERS—FLUXES Per gal., 80–300 penetration,		CUTBACK ASPHALT Per ton,		ROAD OILS Per gal.,	ASPHALT EMULSION Per gal.	
	Granite per M, lots of 50,000, 4x4x8 in.	Brick per M, 3x4x8½ in., carload lots	Wood per sq. yd., 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	$75.00	$35.85	$2.25	$18.20*e*	$23.41*e*	$0.0728*e*	$0.1049*e*	.0768*he*	.1089*he*	$0.0668*e*	$0.0834	$0.0834
Baltimore	130.00	44.00	2.40	17.00	22.00	.075	.10	.09*h*	.125*h*	......	......	
Birmingham	110.00	25.00	......	19.00	24.00	.0878	.1128	.10*h*	.137*h*	......	.06	
Boston	70.00	46.00	3.00	17.00	22.00	.07*i*	.095*i*	.09*hi*	.12*hi*	.075*i*	.095*i*	[illegible]
Chicago	140.00	46.00	2.50	18.00	23.00	17.00*g*	22.00*g*	.07*h*	.11*h*	.045	.09	[illegible]
Cincinnati	112.00	37.50	......	13.47	17.47	.12	......	17.00	......	.051	.078	
Cleveland	100.00*a*	37.50	2.85	18.00	21.75	.081	.099	.091*h*	.061*h*	.06	.09	[illegible]
Dallas	......	32.50	......	19.00	22.75	.075	.10	20.00	28.00	.055	.085	[illegible]
Denver	......	27.50	......	......	......	......	......	......	......	......	......	
Detroit	......	35.00	......	16.72*f*	21.97*f*	......	......	15.60	20.60	.0535	.1125	[illegible]
Kansas City	......	44.00	......	18.50	23.50	.077	.1075	.077*h*	.107*h*	.057	.11	[illegible]
Los Angeles	......	50.00	......	11.00	15.16	11.00*g*	15.16*g*	11.00	......	.042	.06	[illegible]
Minneapolis	......	27.50	1.90*d*	21.70	26.70	.098	.137	21.85	34.65	.0638	......	
Montreal	85.00*c*	60.00	3.42	14.00	20.00	.10	.13	.0975*h*	.01125*h*	.0675	.135	[illegible]
New Orleans	100.00	32.00	......	14.00	17.00	.065	.09	.07*h*	.10*h*	......	.078	[illegible]
New York	138–143*b*	65.00	2.80	17.00	22.00	.075	.10	.09*h*	.125*h*	......	.075	[illegible]
Philadelphia	120.00	45.00	......	15.00	20.00	.06	.085	.065*h*	.095*h*	.055	.07	[illegible]
Pittsburgh	115.00	40.00	......	19.00	24.00	.077	.1125	.086*h*	.121*h*	.0675	......	
St. Louis	115–130	37.00	......	19.00	24.00	.075	.11	.08*h*	.115*h*	.0475	.09	[illegible]
San Francisco	......	70.00	......	12.00	18.00	12.00*g*	18.00*g*	12.50	23.00	.04	.0575	[illegible]
Seattle	......	40.00	......	25.50	25.50	17.00*g*	23.00*g*	15.00	......	.03	.19	[illegible]

PAVING BRICK: *a* 4½x6x5½ in. *b* 4x5x9 in. aver. *c* Sales tax included. WOOD BLOCKS: *d* 2½ in. 6 to 8-lb. treatment. ASPHALT: *e* Local reduction due to 20% reduction intra-state class freight rates, only Georgia affected. *f* Mexican. *g* Per ton. *h* Per gallon. *i* F.o.b. Everett. *Note:* Paving asphalt, tank or boat, f.o.b. Maurer, N. J., per ton, Bermudez, $25.00; Trinidad, $22.00.

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS. ¾-in. billet *b*	RIVETS ½-in. structural	WIRE NAILS Base	SHEET PILING Base	STEEL RAILS Per Gross Ton Standard	STEEL RAILS Light	STEEL RAILS Re-rolled	TRACK SUPPLIES Angle bars	TRACK SUPPLIES Std. spikes *c*	TRACK SUPPLIES Tie plates *c*	TRACK SUPPLIES Track bolts
Birmingham	$2.40	$2.60	$3.70	$2.55	....	$42.50	$43.00	$42.00	$2.80	$3.15	$2.30	$4.35
Chicago	2.30	2.60	3.70	2.80	$2.70	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Pittsburgh	2.25	2.55	3.60	2.75	2.60	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Buffalo	2.35	2.60	....	....	....	....	....	....	....	....	2.30	....
Cleveland	2.435†	2.60	....	....	....	....	....	....	....	....	....	....
Youngstown	....	2.60	....	....	....	....	....	....	....	3.15	....	....
Gulf ports	2.65a	2.95a	....	....	3.05a	....	....	....	....	....	....	....
Pacific ports	2.80a	2.95a	....	....	3.05a	....	....	....	....	3.15	2.40	....

† Delivered. *a* F.o.b cars dock. REINFORCING BARS: *b* For rail steel deduct 15c. from billet prices. TRACK SUPPLIES: *c* Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., on spikes alone, Lebanon, Pa., Richmond, Va.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb., base price	REINFORCING BARS Per 100 lb., ½ in., base price 15 tons or over *b* New billet	Rail steel	Add $ cwt. for Switch	Del.	EXPANDED METAL LATH Per 100 sq. yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 s.f., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires Per sq. yd.	SHEET PILING Per 100 lb base price
Atlanta	$3.65	$2.82	$2.67	.02½	.10	$21.00	$23.00	$1.75	$1.31	$0.1692	$2.60
Baltimore	3.60	2.82	2.67	....	.10	21.00	23.00	1.62	1.22	.1566	2.95
Birmingham	2.40*a*	2.60	2.45	.02½	.10	22.50	24.50	....	....	....	....
Boston	4.07	3.03*c*	2.88*c*	$20 C.L.	.10	21.60‡	23.60‡	1.68	1.26	.1620	3.02
Chicago	2.30*a*	2.60	2.45	.03	.05	23.00	25.00	1.61	1.22	.1557	2.70
Cincinnati	3.95	2.815*c*	2.665*c*	....	.05	25.01	29.50	1.60	1.21	.1548	....
Cleveland	3.86	2.60	2.45	.02½	.10	22.00	24.00	1.59	1.20	.153	....
Dallas	2.45	3.335	3.185	....	....	.....	.....	1.86	1.38	.1791	2.85
Denver	4.48	4.15	4.00	....	....	22.00	25.00	1.87	1.38	.1809	....
Detroit	3.95‡	2.70	2.55	....	.10	22.50	24.50	1.62	1.22	.1566	2.865
Kansas City	4.24	3.02	2.87	.0	.10	20.50	22.50	1.82	1.29	.1665	3.12
Los Angeles	3.825	2.90	2.75	.02½	.05	23.00	27.50	1.89	1.40	.1827	3.90
Minneapolis	4.00‡	3.00	2.85	.0	.10	26.00	30.00	1.71	1.28	.1656	3.00*d*
Montreal	2.90	2.40	2.40	....	....	32.50	32.50	2.46	1.82	.253	2.80
New Orleans	....	2.94	2.79	.05	.10	21.00	23.00	1.76	1.31	.1701	....
New York	3.97	2.88	2.73	....	.10	21.50	23.00	1.67	1.26	.1584	2.93
Philadelphia	3.90	2.84	2.69	....	....	22.50	24.50	1.63	1.23	.1575	2.89
Pittsburgh	2.25*a*	2.55	2.40	.02½	.10	20.00	22.00	1.55	1.18	.1494	2.60
St. Louis	3.99	2.87	2.72	.0	.05	24.00	26.00	1.62	1.21	.1566	2.97
San Francisco	3.95	2.95	2.80	.02½	.10	24.50	26.50	1.89	1.39	.1827	3.15
Seattle	3.55	2.95	2.80	....	....	25.00	30.00	1.89	1.39	.1827	2.60

‡ Delivered. STRUCTURAL SHAPES: *a* Mill prices. REINFORCING BARS: *b* 5–15 tons, add 15c. 1–5 tons, add 25c. Less than 1 ton, add 50c. *c* 20 tons or over Base. SHEET PILING: *d* Mill price plus freight.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in. *a*	VITRIFIED SEWER PIPE Per foot, delivered, 8 in., s.s.	12 in., s.s.	ASTM 24 in., d.s.	C13–35 36 in., d.s.	CLAY DRAIN TILE Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTM C 14–35 12 in.	24 in.	WROUGHT STEEL PIPE Full standard weight, *h* 1 to 3 in., Butt Weld Black %	Galv. %	3½ to 6 in., Lap Weld Black %	Galv. %
Atlanta	$50.00	$0.26*bc*	$0.468*bc*	$1.69	$4.50*c*	$85.00	$128.00	$0.45	$1.625	44.5	35.5	42	32.0
Baltimore	53.50	.28	.54	2.38	7.18	110.00	170.00	.40	1.60	....	....	....	....
Birmingham	46.00	.25	.45	1.625	4.66	85.00	220.00	.40	1.60	64.5	55.5	62	52.5
Boston	53.50	.224	.432	1.98	5.8425	99.00	153.00	.45	2.50	....	....	....	....
Chicago	54.50	.28	.54	2.25	6.25	100.00	150.00	.38	1.48	52.5	41.25	50.625	37.5
Cincinnati	53.00	.217	.4185	1.80	5.2275	75.00	120.00	.80	2.20	52.6875	41.4375	49.5625	37.6875
Cleveland	54.50	.196	.378	1.62	4.8175	69.00	108.00	.35	1.50	56	44.5	51.5	40.5
Dallas	58.00	.40	....	....	....	160.00	260.00	.46	1.57	69.5	61.5	67	58.5
Denver	66.00	.29†	.50†	2.10†	....	130.00	220.00	....	....	44	33	41	29
Detroit	52.40	.203	.3915	1.71	5.2375	82.00	136.00	.35	1.20	53.2	41.9	50.1	37.8
Kansas City	56.00	.30	.54	2.16	5.00	120.00	240.00	.45	1.60	49	37.6	45.8	34.
Los Angeles	54.50	.2825†	.508†	2.03†	5.535†	115.50	192.50	1.00	2.00	57.1	48.1	54.6	44.6
Minneapolis	56.50	.24†	.432†	1.728†	4.60†	......	......	.65	1.75	....	....	....	....
Montreal	55.00	.33†*e*	.59†*e*	2.04†*e*	....	82.00	134.00	.51	2.04	....	....	....	....
New Orleans	52.00	.26	.468	1.69	....	150.00	220.00	.45	1.65	....	....	....	....
New York	53.00	.28	.58	2.45	6.30	......	......	.55	2.00	52.49*i*	41.53*i*	48.20*i*	37.80*i*
Philadelphia	50.00	.224	.45	2.25	6.00	150.00	180.00	.54	1.80	64.5*i*	55.5*i*	62 *i*	52.5*i*
Pittsburgh	56.00	.182†	.351†	1.575†	4.92†	97.80	154.20	.85*g*	2.00	64.5*j*	55.5*j*	62*j*	52.5*j*
St. Louis	47.00	.28	.504	2.016	3.96	85.00	170.00	.75	1.75	51.125	39.875	48.70	36.125
San Francisco	54.00	.315*d*	.567*d*	2.268	5.67	103.50	172.50	.45	2.50	53	44	42.75	33.33
Seattle	55.50	.420	.63*f*	3.06*f*	7.55*f*	85.00	200.00*	.50*	1.60	65.80	57.25	66.75	56.30

† F.o.b. * Less 30% in C/L lots. CAST IRON PIPE: *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $50.00. Gas pipe and class A, $3 per ton additional 30 in. and larger usually $2 per ton less. VITRIFIED PIPE: *b* Double strength. *c* List to dealer. *d* List. *e* Sales and municipal taxes extra. *f* Less 30% in C/L Lots. CONCRETE PIPE: *g* Culvert pipe. WROUGHT STEEL PIPE: *h* Discounts from standard list for delivery from warehouse, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ½ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92. *i* Resale price to consumer, car load lots shipped from mill. *j* Applies also at Lorain, Ohio mills. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at destination. WROUGHT IRON PIPE: Base price and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base: Buttweld — 1 in. and 1¼ in. black 30, galv. 14; 1½ in. black 34, galv. 16½; 2 in. black 33½, galv. 16. Lapweld — 2½ in. to 3½ in. black 27½, galv. 12½; 4½ in. to 8 in. black, 28½ galv. 15.

LUMBER, TIMBER, PLYWOOD—PER M FT. B.M., CARLOAD LOTS F.O.B.

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR — All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face) All Fir planks No. 2 common; Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italic)									LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
	1x6, S4S	1x8, S4S	2x4, S4S	2x6, S4S	2x8, S4S	2x10, S4S	3x12, Rgh	6x12, Rgh	12x12, Rgh	2x12, Rgh	12x12, Rgh	⅝″	
Atlanta	**$17.00**	**$17.00**	**$17.00**	**$17.00**	**$17.00**	**$20.00**	**$25.00**	.....	.....	$45.00	$47.00	$16.80	$20.30
Baltimore	**30.00**	**30.00**	**32.50**	**32.50**	**32.50**	**35.00**	**44.00**	.....	.....	66.00	66.00	16.45f	20.05f
	35.00	*35.00*	*36.00*	*34.00*	*34.00*	*35.00*	*38.00*	*$37.00*	*36.00*	.....	.....	.....	
Birmingham	**22.00**	**22.00**	**24.00**	**23.00**	**24.00**	**27.00**	**32.00**	**32.00**	**32.00**	.....	.....	15.55	18.95
‡	26.00	26.00	30.00	29.00	30.00	35.00	54.00	.....	.....	48.00	53.00	.....	
Boston	35.00[2]	35.00[2]	40.00[3]	40.00[3]	55.00[1]	65.00[1]	80.00[1]	.....	.....	80.00	80.00	16.45f	20.05f
	35.00	*35.00*	*40.00*	*40.00*	*40.00*	43.00	*45.00*	*50.00*	*50.00*	.....	.....	.....	
Chicago	**28.00**	**29.00**	**28.00**	**28.00**	**28.00**	**34.00**	**42.00**	.....	.....	70.00	70.00	12.45	15.15
	35.00	*35.00*	*35.00*	*35.00*	*36.00*	*36.00*		*44.00*	*44.00*				
Cincinnati	**25.50**	**25.50**	**25.50**	**24.50**	**25.50**	**28.50**	**39.50**	.....	.....	41.00	44.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	
Cleveland	**35.00**	**37.00**	**42.00**	**35.00**	**43.00**	**45.00**	**52.00**	*49.00*	*48.75*	55.00	67.00[8]	15.55	18.95
Dallas e	**30.00**	**31.00**	**33.50**	**29.50**	**32.00**	**33.50**	**46.50**	**51.00**	**69.50**	62.50	87.50	13.15	16.05
Denver ‡	46.00[4]	46.00[4]	50.00[4]	49.00[4]	49.00[4]	55.00[4]	54.00[4]	64.00[4]	67.50[4]	.....	.....	9.35	11.55
Detroit	**27.00**	**27.00**	**27.00**	**27.00**	**27.00**	**29.00**	**38.00**	.....	.....	32.00	44.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	*43.00*	*43.00*	*43.00*	.....	.....	.....	
Kansas City	**28.00**	**28.00**	**29.00**	**28.00**	**28.00**	**30.00**	**40.00**	.....	.....	55.00	60.00	11.45	13.95
	29.00	*29.00*	*32.00*	*32.00*	*32.00*	*33.00*	*35.00*	*38.00*	*38.00*	.....	.....	.....	
Los Angeles a	*36.00*	*35.00*	*36.00*	*35.00*	*37.00*	*37.00*	*41.00*	*48.00*	*43.00*	.....	.....	8.90fg	10.80fg
Minneapolis ‡b	54.00[6]	54.00[6]	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.45	13.95
‡	*45.00*	*45.00*	*48.00*	*46.00*	*46.00*	*47.00*	*65.00*	*67.70*	*67.00*	47.00	.....	.....	
Montreal [7]	46.60	48.60	52.00	50.00	54.00	69.00	84.00	.....	.....	.....	.....	.....	.....
	54.75	*54.75*	*49.25*	*60.75*	*60.75*	*64.25*	*47.00*	.....	.....	.....	.....	.....	.....
New Orleans	**33.00**	**36.00**	**42.00**	**34.00**	**40.00**	**39.00**	**50.00**	.....	.....	54.00	59.00	13.15	16.05
	28.95	*31.50*	*35.90*	*29.50*	*33.00*	*34.00*	*38.00*	.....	.....	.....	.....	.....	
New York ‡	**38.00**	**39.00**	**37.50**	**40.00**	**40.00**	**41.00**	**46.00**	.....	.....	80.00	82.50	16.45f	20.05f
‡	.....	.....	*47.50*	*47.50*	*47.50*	*47.50*	*47.50*	*52.50*	*52.50*	.....	.....	.....	.....
Philadelphia	**27.50**	**29.00**	**28.50**	**29.00**	**30.00**	**31.00**	**33.50**	.....	.....	70.00	70.00	16.45f	20.05f
	40.00	*40.00*	*38.25*	*39.00*	*40.00*	*40.00*	*40.00*	*46.50*	*46.50*	.....	.....	.....	
Pittsburgh	**38.10**	**39.90**	**47.05**	**42.00**	**45.65**	**46.90**	**59.70**	.....	.....	57.50	57.50	16.20	19.70
	51.90	*49.60*	*49.60*	*49.00*	*48.90*	*49.25*	*66.55*	*66.55*	*66.55*	.....	.....	.....	.....
St. Louis ‡c	**32.00**	**33.00**	**31.00**	**30.00**	**31.00**	**32.00**	**49.00**	*53.00*	*53.00*	72.00	71.00	13.15	16.05
San Francisco d	*26.50*	*22.00*	*27.00*	*22.50*	*26.50*	*22.50*	*29.00*	*22.00*	*22.00*	.....	.....	6.95f	8.50f
Seattle	*17.50*	*17.50*	*17.50*	*16.50*	*16.50*	*16.50*	*22.00*	*21.00*	*21.00*	.....	.....	0.00	0.00

LUMBER NOTES: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers' N.C. Pine. [3] Spruce. [4] Native. [6] Western Pine, No. 3 Common. [7] Pine. [8] Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors in Minneapolis and St. Paul get 10% disc. from list. *c* 5M ft. or less. *d* At ship's tackle. *e* 10% discount taken off.

PLYWOOD: Note: Special concrete form grade Fir Plywood, 4′ by 8′ panels, 5-ply, sanded 2 sides, water resistant glue, car load lots, delivered per 1000 sq ft surface. Base price — Seattle: ⅝″, $72.25; ¾″, $82.45. For other centers add rail freight increment from table for proper size. Add: for form oil treatment, $2.50 per M. sq.ft.; for mineral paint sealed edges, $1.00 per M; for resin dipped treatment, $10.00 per M. *f* Lower rate by water shipment. *g* 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS — Discounts from latest jobbers list, Sept. 15, 1928 — Single or Double Thickness		EXPLOSIVES — Per lb. dynamite delivered 50-lb. cases — Gelatin	
	A quality	B quality	40%	60%
Atlanta	85%	87%	$0.15	$0.165
Baltimore	88%	87%	.16	.18
Birmingham	88%	90%	.095	.11
Boston	87%	89%	.16f	.175f
Chicago	86%	87%	.115d	.13d
Cincinnati	89-10%	91-10%	.27	.29
Cleveland	85-10%	85-10%	.205	.215
Dallas	80%	80%	.16	.170
Denver	85%	86%	.16	.175
Detroit	87-10%	89-10%	.21	.24
Kansas City	85-10%	86-10%	.165	.18
Los Angeles	90% a	90-40%	.1725e	.1925e
Minneapolis	84-10%	85-10%	.175	.19
Montreal	60-30%	70-5%	.18	.1975
New Orleans	86%	86% b	.16	.185
New York	89%	90%	.23c	.245c
Philadelphia	88%	89%	.16	.175
Pittsburgh	86%	87%	.1525	.165
St. Louis	88%	88%	.155	.17
San Francisco	78%	83%	.1475	.1625
Seattle	83%	86%	.1525	.1625

GLASS: *a* Disc. from list Aug. 1, 1929. *b* Single thickness. Double 85% A and 80% B quality discount.

EXPLOSIVES: *c* Additional delivery charge in Queens, Richmond, Kings and South of Canal St., Manhattan, $6 per trip. *d* Carload lots. *e* F.o.b. Arsenal. *f* = $4.00 delivery charge under 350 lb.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb	$2.00-2.85
Calcium chloride, 77-80%, flaked, in 400-lb. drums or 100-lb. moisture proof bags, f.o.b. works, freight equalized with points of competition, per ton	22.00-35.00
Chlorine cylinders, per lb. delivered	.055
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	1.60

PILES, TIES—F.O.B.

PILES

Prices per linear foot, pine, with bark on, f.o.b. New York; delivered from barge 1½ to 2c. per ft. additional:

Dimensions	Points	Length	Short Leaf — Barge	Ra
12 in. at butt	6 in.	30 to 50 ft.	$0.18	$0.195
12 in.—2 ft. from butt.	6 in.	50 to 59 ft.	.225	.24
12 in.—2 ft. from butt.	6 in.	60 to 69 ft.	.23	.255
14 in.—2 ft. from butt.	6 in.	50 to 69 ft.	.24	.265
14 in.—2 ft. from butt.	6 in.	70 to 79 ft.	.265	.275
14 in.—2 ft. from butt.	5 in.	80 to 85 ft.	.38	.415
14 in.—2 ft. from butt.	5 in.	85 to 89 ft.	.42	.482

RAILWAY TIES

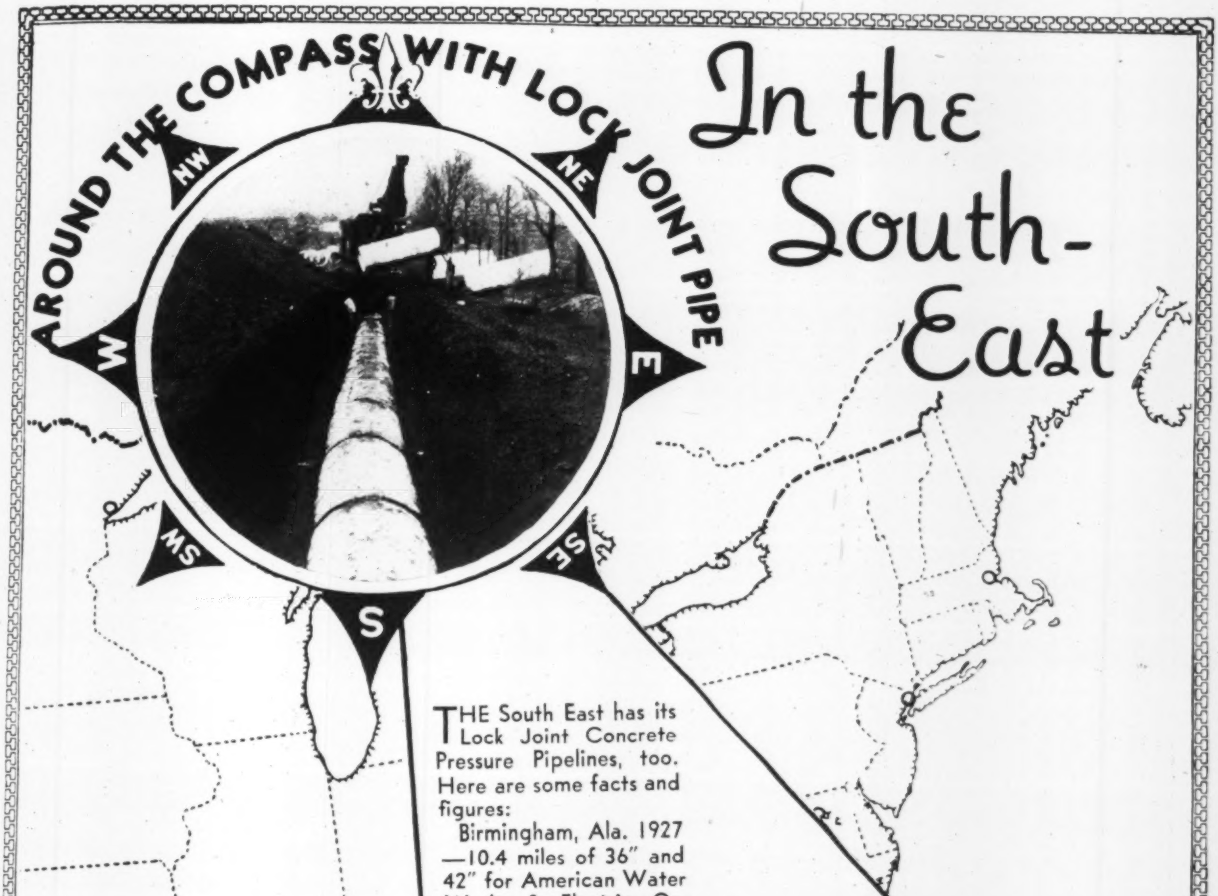
Prices f.o.b., per tie, for carload lots:		6″ x 8″ x 8′ Untr.	6″ x 8″ x 8′ Tr.	7″ x 9″ x 8′ 6″ Untr.	7″ x 9″ x 8′ 6″ Tr.
Boston	Oak	$1.20	....	$1.75	
	Pine	1.25	$1.75a	1.90	$2.65a
New York	L.L. Sap Pine	1.10	....	1.30	....
	Mixed Oak	1.55	....	1.75	....
Birmingham	White Oak	.85	1.50a	1.35	1.70a
	Southern Pine	.55b	1.10ab	.70	1.30a
Chicago	Oak	....	1.67ac	....	2.05a
	Oak	....	1.55d	....	1.90d
	Southern Pine	....	1.50a	....	1.95a
Los Angeles	Douglas Fir	.64	1.38a	.90	1.80a
Philadelphia	Red Oak	1.25	....	....	2.60a
St. Louis	White Oak	1.15	....	1.48	
	Red Oak	1.15	1.65a	1.48	2.00a
	Sap Pine or Cypress	.97	....	1.10	
San Francisco	Douglas Fir	1.15be	....	....	2.45ae
Montreal	Birch or Maple	.65	1.05	.75	1.35

TIES: Tr.— Treated; Untr.— Untreated. *a* Creosoted. *b* 6″ x 8″ x 8′ 6″. *c* Empty cell. *d* Zinc. *e* Green.

CHEMICALS, Continued

Soda ash, 58%, in paper bags, per 100 lb. dense	1.25
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	27.00
Sulphate of copper, in bbl., per 100-lb	5.15

(Continued on page 32)



In the South-East

THE South East has its Lock Joint Concrete Pressure Pipelines, too. Here are some facts and figures:

Birmingham, Ala. 1927—10.4 miles of 36" and 42" for American Water Works & Electric Co.

St. Petersburg, Fla. 1929—26.0 miles of 36" for Pinellas Water Co.

Charleston, So. Car. 1936—3.5 miles of 48" for West Virginia Pulp & Paper Co.

Over 210,000 feet of pipe.

Pressures ranging from 50 feet to over 300 feet of head.

More than 18,000 joints and not one has ever needed repairs.

Measured leakage on completed pipelines averaged less than 20% of specified allowance.

Carrying Capacity ranges from C-142 to C-150, demonstrated by actual tests on long sections including specials and bends.

Inherent strength and permanence assured by conservative design of steel adequately protected by dense concrete.

Hundreds of thousands of dollars spent for local labor and local materials, through the manufacture of the pipe right in the City where it was installed.

The records of these three jobs illustrate the full measure of Quality, Dependability, and Economy which is a part of every Lock Joint Pipe Line, be it South, East, North, or West.

SEWER
CULVERT
PRESSURE
SUBAQUEOUS

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

LOCK JOINT
PIPE COMPANY
Established 1905
AMPERE, NEW JERSEY

(Continued from page 30)

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M, lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M, lots of 2,000 pieces or over,			BRICK Per M, in quantity,		LIME		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Per ton, Hydrated finishing	in paper, Common hydrated	carload lots Pulverized or Lump
Atlanta	$63.20	$67.40	$126.30	$126.30	$147.40	$168.40	$12.75	$15.15	$19.50	$14.00	$14.00
Baltimore	91.00	98.00	183.00	219.00	315.00	390.00	13.00	17.00	20.00	14.00	25.00
Birmingham	78.75	84.00	157.50	189.00	201.25	242.00	15.00	19.00	3.00*o*	1.75*o*	2.25*o*
Boston	86.25*ab*	92.00*ab*	172.50*ab*	195.90*ab*	211.65*ab*	242.00*a*	16.00*i*	19.00*i*	20.00	15.50	3.50*p*
Chicago	66.00	70.50	132.00	174.30	214.40	245.00	11.00	12.00	14.00	12.80	12.00
Cincinnati	56.45	60.40	115.25	138.70	166.50	206.40	17.50	17.50	15.80	12.70	
Cleveland	49.00	52.00	97.50	117.00	149.00	185.00	16.50	16.50	16.80*j*	14.40*j*	2.65*m*
Dallas	59.00	62.00	125.00	149.00	155.00	177.00	9.50	24.00	19.00	16.00	95
Denver	78.50	88.00	141.50	160.65	196.00	222.50	12.00	15.50	30.00*j*	22.00*j*	25.00*j*
Detroit	71.85	76.65	143.70	230.00	280.00	325.00	12.50	13.50	18.00	15.00	13.25
Kansas City	64.50	66.50	81.00*c*	125.50	159.75	186.25	14.00	24.00	18.90	12.60	10.50
Los Angeles	77.50	94.25	134.00*c*	188.00	232.50	311.50	12.00	14.00	18.70	.....	19.70
Minneapolis	80.35	85.70	146.00	192.85	176.20*d*	245.20*d*	13.10	15.10*g*	21.00	16.00	19.00
Montreal	84.00*a*	96.00*a*	180.00*a*	......	273.00	......	15.50	20.75	23.50	17.00	11.00
New Orleans	72.00	72.00	135.00	162.00	180.00	220.00	14.00	.....	18.30	12.60	
New York	87.00	93.00	128.00*c*	193.30*h*	238.80*h*	295.60*h*	12.50	.....	20.00	15.50	20.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	15.00	18.00	16.10	11.40	16.90
Pittsburgh	58.40	62.30	116.85	165.00	217.00	250.00	17.50	25.00	17.50	15.20	2.30*m*
St. Louis	62.00	65.00	120.00	180.00	234.00	280.00	16.00	17.00	.55*k*	.40*k*	2.30*m*
San Francisco	84.00	94.50	225.00	......	......	......	15.00	18.00	.55*o*	.40*o*	2.05*m*
Seattle	110.00	130.00	210.00	110.00*e*	......	......	20.00*f*	20.00	30.00	20.00	28.60

STRUCTURAL CLAY TILE: *a* Smooth. *b* Carload lots delivered to job. *c* 6 x 12 x 12 in. *d* Not load bearing. *e* 8 x 8 x 8 in. only. BRICK: *f* Less $1.0 cash 15 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* 50c. per M off for cash. LIME: *j* LCL. *k* Per sack. *l* Lump. *m* Per bbl., 180 lb. *n* Per 100 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag.

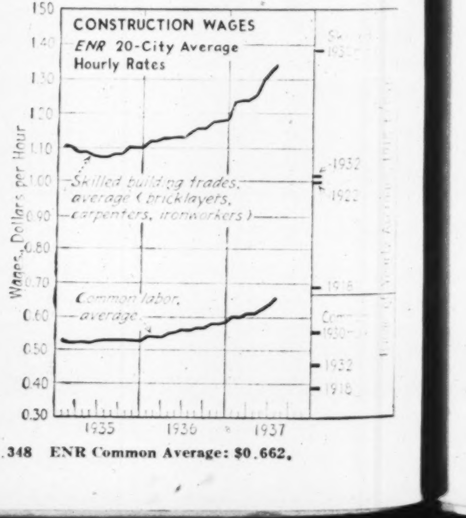
PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in 500-lb. lots in oil	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES Carload lots f. o. b. factory				
			Graphite *b*	Aluminum *c*	Ferric Oxide *d*	Rolls, slate surfaced, 85-90 lb., per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 350 lb. bbl. per ton
Atlanta	$9.75	$12.375	$1.62	$3.17	$1.40	$2.68	$2.36	$2.36	$.36	$29.40
Baltimore	9.50	12.00	1.45	2.25	1.70	2.16	3.25	3.25	.40	27.00
Birmingham	9.75	12.375	2.35	2.35	1.85	2.16	2.14	2.14	.36	22.00
Boston	9.50	12.00	1.75	2.40	.045*e*	1.96	2.25*h*	2.14*h*	.45	20.00
Chicago	9.50	12.00	1.80	....	....	2.47	2.37	2.37	.43	33.00
Cincinnati	9.50	12.00	1.45	2.50	1.40	2.40	2.39*h*	2.39*h*	.36	21.00
Cleveland	9.50	12.00	1.90	2.60	1.40	2.10	2.14*h*	2.14*h*	.32	29.00
Dallas	9.75	12.75	1.80	2.10	....	2.75*h*	2.50*h*	2.50*h*	.60	60.00
Denver	10.00	12.50	2.55	....	....	2.65	4.00	4.00	.35	30.00
Detroit	9.50	12.00	1.80	2.50	1.50	2.30	2.65	2.50	.35	30.00
Kansas City	9.50	12.125	2.15*g*	2.40*g*	1.67*g*	1.93	3.15	3.15	.25	25.00
Los Angeles	9.75	12.25	1.60	2.25	2.30	2.10	1.50	....	.45	
Minneapolis	9.50	12.125	....	....	....	1.85*i*	1.78*hi*	1.78*hi*	.29	23.80
Montreal	....	8.20	2.00*f*	4.75*f*	2.40*f*	2.50	1.60	1.83	.50	1.52
New York	9.50	12.00	1.90	2.60	1.65	1.85	1.87*h*	1.87*h*	.033*e*	26.00
Philadelphia	9.50	12.00	2.515	2.94	1.515	1.95	2.86*h*	2.86*h*	.29	26.00
Pittsburgh	9.50	12.00	1.05	1.95	.80	1.95	1.94*h*	1.94*g*	.34	26.00
St. Louis	9.50	12.00	1.70/1.90	2.50/2.60	1.50/1.80	1.90*h*	2.70	2.70	.25/.30	28.00
San Francisco	9.75	12.00	1.80	2.75	1.10–2.00	1.66	1.90	1.90	.325	20.50
Seattle	9.75	12.25	1.80	2.85	2.20	1.97	2.42	2.60	.60	28.00

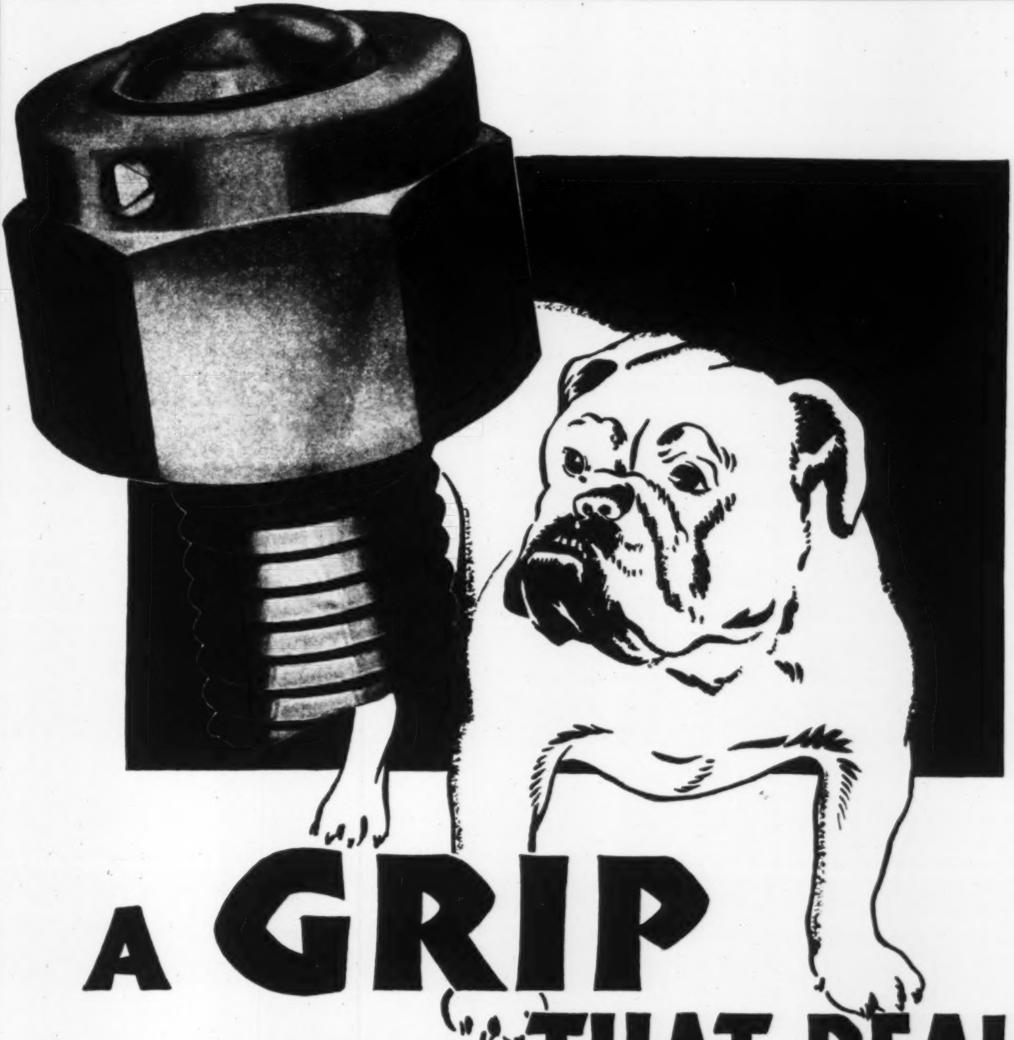
RED LEAD: Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. READY MIXED PAINT: *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% maximum ferric oxide. *e* Per lb. *f* Sales tax included. *g* 5 gal. cans. ROOFING: *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Per 100 lb.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor Building	Common Labor Heavy Const.
Atlanta	$1.25	$0.40/1.00	$1.00/1.25	$1.00/1.25	$1.25	$0.40/.50	$0.40/.50
Baltimore	1.25	1.25	1.375	1.50	1.25	.45	.45
Birmingham	1.50	1.125	1.25	1.125	1.00	.30/.40*a*	.30/.40*a*
Boston	1.50	.90/1.375	1.375	1.00/1.375	1.625	.60/.85	.60/.85
Chicago	1.70	1.625	1.625	1.625	1.70	1.025	1.025
Cincinnati	1.00/1.625	.70/1.35	1.40	1.00/1.40	1.00/1.625	.60/.75	.60/.75
Cleveland	1.625	1.375	1.50	1.50	1.50	.90	.90
Dallas	1.25	1.00	1.00	1.00	1.25	.40	.40
Denver	1.50	1.50	1.43	....	1.43	.714	.714
Detroit	1.50	1.25	1.25	1.25	1.55	.60/.80	.60/.80
Kansas City	1.325	1.25	1.25	1.25	1.45	.80	.45/.50
Los Angeles	1.10	1.10	1.125	1.25	1.25	.625	.625
Minneapolis	1.375	1.25	1.50	1.40	1.50	.85	.85
New Orleans	1.00	.75/1.00	1.00/1.25	1.00	1.00	.30/.40	.30/.40
New York	1.886*b*	1.75*b*	1.925	2.00*b*	2.00*c*	.95	.60/.85
Philadelphia	1.50	1.00	1.375	1.50	1.375	.40/.50	.40/.50
Pittsburgh	1.75	1.50	1.50	1.25	1.75	.80	.70
St. Louis	1.50	1.25	1.75	1.57/1.75	1.50	.875	.45/.875
San Francisco	1.50	1.125	1.375	1.125	1.50	.75	.60
Seattle	1.50	1.335	1.375	1.375	1.50	.90	.90
Montreal	.70	.60	.65	.55	.70	.40	.35



a PWA *b* 7 hr. day. *c* 6 hr. day. **ENR Skilled Average:** (Bricklayers, Carpenters, Ironworkers) **$1.348** **ENR Common Average: $0.662.**



A GRIP THAT REALLY HOLDS......

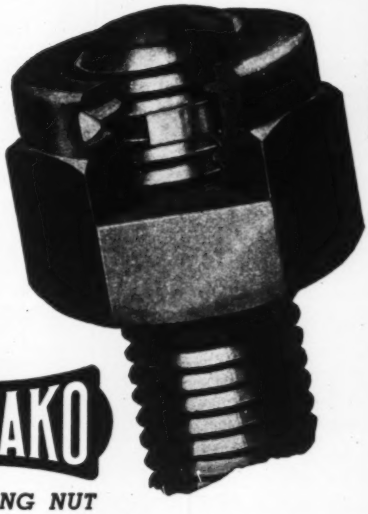


Fig. 1510 (above)—Cutout section of UNSHAKO Nut, showing Locking Ring in position.

UNSHAKO

SELF-LOCKING NUT

Once in, no amount of jarring or vibration can loosen the UNSHAKO Self-Locking Nut. *(Yet it backs off easily with the aid of an ordinary wrench.)*

The built-in, self-locking ring or floating thread holds it fast (without fuss with straying pins or washers) and absolutely prevents accidents and failures from loosened nuts in vibration wracked machines.

Complete information and prices cheerfully furnished.

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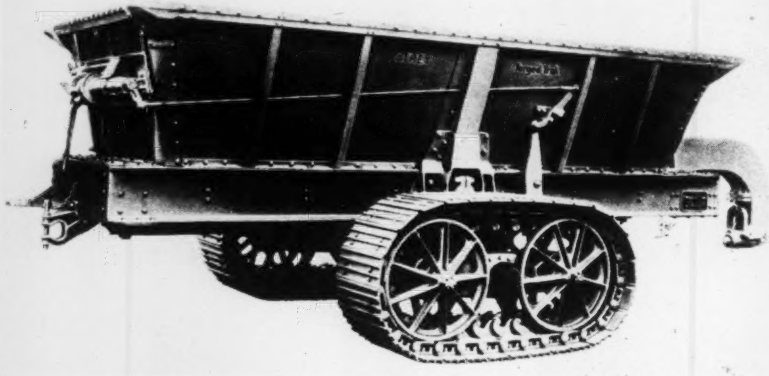
NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Eighteen Yard Wagon

The Athey Truss Wheel Co. of Chicago has rounded out its line of Forged-Trak equipment with the announcement of its new 18-yd. bottom-dump trailer mounted on 30-ton wheels.

The unit has very rigid construction, and the axle and draw-bar are spring mounted to absorb loading and road shocks. There is a positive mechanical winder.

Athey officials say that the new wagon offers the larger capacity necessary to take advantage of the greater tractive power available in the new tractors.

• • •

Fillet Welding Electrode

A new electrode, Fleetweld, which has been developed by the Lincoln Electric Co., Cleveland, is intended to eliminate the necessity of multiple pass welding in the production of fillets and lap welds. Fillet welds up to 3/8 in. size with one plate vertical can be produced in one pass with the new electrode, the company says.

The tensile strength of the weld metal as deposited is 68,000 to 72,000 lb. per sq. in. The metal possesses an elongation of 20 to 30 per cent as deposited and 30 to 36 per cent when stress-relieved. Other properties are equal to or better than mild steel.

• • •

Filter Floor Blocks

The Aerodrane filter block of the Universal Sewer Pipe Corp., Cleveland, Ohio, for the floors of trickling filters was designed to achieve a combination of maximum air flow for aeration of filter beds and maximum effluent discharge. Since the Aerodrane floor system may be laid without special mason work and since the blocks are made of an acid resisting, vitrified clay, unusual initial and operating economies are claimed for the blocks.

The vertical tuyeres which admit air to the filter are placed above the effluent entrances to ensure a high aeration efficiency by preventing the tuyers from being covered with effluent on the bottom of the bed. The smooth, rounded effluent channels are below the level of the effluent entrance. The block provides a flush fit with abutting blocks, and dowel holes are provided to insure correct alignment. Reinforced shoulders on the tile carry the weight.

• • •

New 2-Yd. Excavator

Harnischfeger Corp., Milwaukee, have announced a new P&H model 855 in their line of P&H Pacemakers. The manufacturer states that this is the first 2-yd. excavator to be built with all welded construction of new alloy steels and that the machine combines increased strength and rigidity with decreased weight.

The 855 is fully convertible as shovel, dragline, crane or clamshell. The standard shovel boom is 25-ft. long and is fitted with a large boom point sheave for cable economy. The 60-ft. dragline boom is built in two sections and may be extended on the job.

Used as a dragline, the 855 accommodates shoes in widths from 24 in. to 36 in. For unusually soft ground conditions, provision has been made for removing the corduroy frames and for extending the length of the cats.

Powered by an 8 cylinder Fairbanks-Morse diesel engine, the 855 has a hoist-line speed of 141 ft. per minute and a pull of 26,000 pounds.

NEW PUBLICATIONS

CONCRETE JOIST and rod spacing scales and design tables, have been developed by the Universal Atlas Cement Co., 208 South La Salle St., Chicago, Ill. They include all standard spacings for joists cast in place over 20- and 30-in. steel forms in form depths varying from 6 to 14 in. and widths of joists from 5 to 7 in. Four standard spacings are provided for use with precast concrete joists. Scales are included for rod spacings in solid concrete slab construction. Design tables are printed with the scales on tough Bristol board.

"GRAVEL AND ROCK" is a catalog of the crushing and screening equipment for those materials manufactured by Pioneer Gravel Equipment Manufacturing Co., 1515 Central Ave., N.E., Minneapolis, Minn. In an attractive make-up, it briefly describes the major plants and units in the Pioneer line and gives the correct application of each of these units.

SECTION DETAILS and pictures of applications of "Corrugated Steel Sheet Piling" are given in a 16-page booklet published by the Corrugated Steel Sheet Piling Corp., Builders Building, Chicago, Ill.

THE USE of "Trinidasco" on pavement is shown in a number of interesting pictures of applications throughout the country, and its properties are described in a new booklet of the Barber Co., Inc., 1600 Arch St., Philadelphia.

PITTSBURGH-DES MOINES Steel Co., 3415 Neville Island, Pittsburgh, Pa., issues "Bulletin No. 301" consisting of eight pages of photographs devoted to the uses of the company's construction steel.

LATEST MODELS of Tag non-indicating controllers for temperature, pressure, and time, and a discussion of various types of Tag controllers, their application, and how they work, are included in "Catalog No. 900C," issued by C. J. Tagliabue Manufacturing Co., Park & Nostrand Aves., Brooklyn, N. Y.

"U. S. S. STAINLESS Steels in Architecture," a publication of United States Steel Corporation Subsidiaries, Carnegie Building, Pittsburgh, Pa., gives detail drawings and number of attractive photographs of architectural treatments involving the use of stainless steel.

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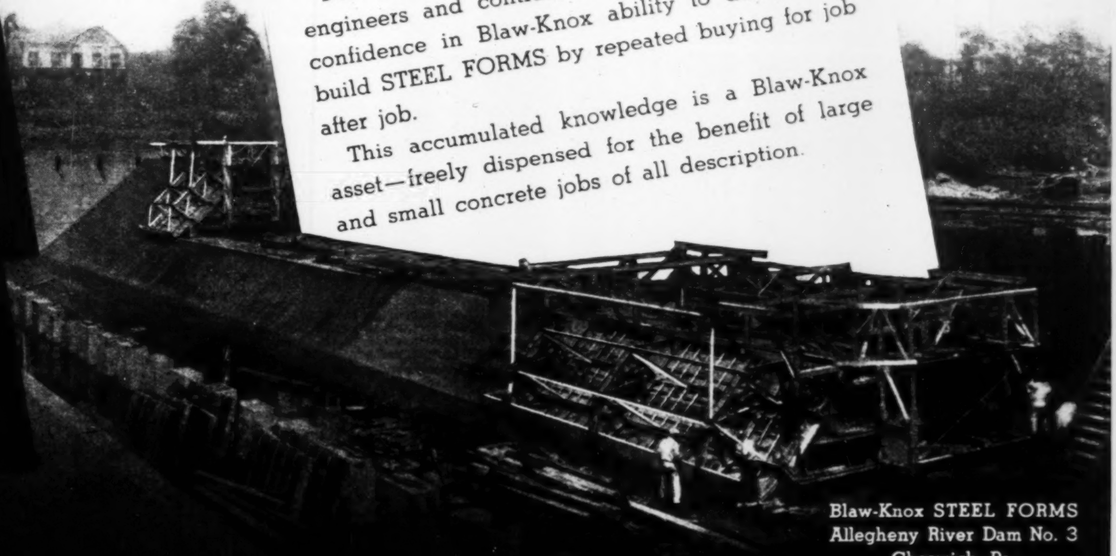

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Offices and Representatives in Principal Cities

(Contract Unit Prices continued from page second preceding)

(Contract Unit Prices continued from page second preceding)

WATER LINE, EUREKA, CAL.

OWNER: City of Eureka, Cal., C. C. Kennedy, Consulting Engineer.

PROJECT: Construction of pipe line unit of the Mad River Water Supply Project, with capacity of 5,000,000 gal. per day delivered at Eureka.

BIDS: Five bids were opened June 3, 1937, ranging from the low of $774,700 to a high of $914,176, with minimum wage rates stipulated of $1.10 per hr. for skilled and 45c. for common labor.

LOW BIDDERS:

1.	United Concrete Pipe Corp. Los Angeles, Cal.	$774.700
2.	Hanrahan-Connolly Co. San Francisco, Cal...	824.566
3.	Morrison-Knudsen Co. Los Angeles, Cal....	847,670

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Redwood stave pipe, 2 band.	51,400 l. f.	$4.45	$4.90	$4.50
2. Additional bands	38,500 ea.	.60	.63	.60
3. Drainage channel excav	600 c. y.	.60	1.00	1.00
4. Struct. steel girders, piers	95,000 lb.	.11	.10	.089
5. Reinf. steel, piers	8,000 lbs.	.07	.07	.07
6. Concrete, cl. B, fdns.	462 c. y.	22.00	20.00	24.00
7. Additional cement	per c. f.	1.00	.70	.80
8. Concrete piles	28 ea.	35.00	35.00	45.00
9. Blow off valve assemblies.	19 ea.	70.00	80.00	75.00
10. C. I. pipe assembly, 4 in	100 l. f.	1.50	1.00	1.50
11. Air, vacuum assemblies	31 ea.	225.00	250.00	235.00
12. Gate valves	3 ea.	650.00	800.00	700.00
13. Trestle foot walk	18 M.b.m.	100.00	80.00	75.00
14. Centrifugal conc. lined and gunite coated steel pipe, 24 in	54,200 l. f.	4.93	5.46	6.40
15. Centr. conc. pipe, 30 in	6,700 l. f.	6.33	7.00	8.15
16. Centr. conc. pipe, 30 in., tunnel	900 l. f.	25.00	25.00	35.00
17. Centr. conc. pipe, welded, 30 in	1,200 l. f.	12.00	5.86	9.00
18. Centr. conc. pipe, 18 in., trench	1,245 l. f.	4.00	5.00	5.00
19. River crossing excav	3,000 c. y.	8.50	6.00	2.95
20. Concrete casing, river crossing	1,000 c. y.	10.00	12.00	15.00
21. C I. pipe, 4 in. plus 12 ft.	100 l. f.	1.00	1.00	2.50
22. Conc. piles, to 20 ft	62 ea.	35.00	24.00	24.00
23. Additional piles required	per l. f.	1.75	2.00	.60
24. Conc. fdn., 24 in., pipe	585 l. f.	37.00	26.00	5.20
25. Timber grillage pipe support	400 l. f.	1.00	1.20	1.25
26. Cent. cast conc. pipe, 30 in.	7,660 l. f.	6.33	7.00	6.20
27. Add. exp. jts. 24 in	250 ea.	12.00	20.00	18.00
28. Concrete, cl. B, anchors	120 c. y.	12.00	20.00	18.00
29. Cement added, except pipe.	per c. f.	1.00	.70	.80
30. Blow off valve assemblies	15 ea.	100.00	120.00	98.00
31. Air release, vacuum assemblies	22 ea.	200.00	300.00	200.00
32. Gate valves, 42 in	3 ea.	700.00	750.00	670.00
33. Gate valves, 20 in	6 ea.	500.00	520.00	480.00
34. Gate valves, 18 in	1 ea.	400.00	410.00	385.00
35. Gate valves, 12 in	1 ea.	170.00	180.00	190.00
36. Flow valve regulators	l. s.	4,000.00	4,000.00	3,600.00
37. Concrete manholes, wood covers	7 ea.	100.00	160.00	103.00
38. Concrete manholes, c. i., covers	3 ea.	125.00	200.00	150.00
39. Air release m.h., wood covers	6 ea.	100.00	150.00	103.00
40. Do. incl. saddle opening	6 ea.	140.00	250.00	225.00
41. Air release m.h., c.i., covers.	12 ea.	125.00	225.00	205.00
42. Gate valve m.h. wood covers	7 ea.	100.00	150.00	103.00
43. Gate valve m.h., c.i. covers.	5 ea.	125.00	200.00	205.00
44. Reinf. conc. valve control pit	1 ea.	500.00	400.00	240.00
45. Reinf. conc. overflow struct.	1 ea.	800.00	300.00	260.00
46. Chlorination bldg. complete.	l. s.	3,500.00	2,300.00	5,500.00
47. Venturi installation	l. s.	2,300.00	2,075.00	1,925.00
48. Monorail trolley, hoist, pump, etc	l. s.	1,600.00	1,150.00	1,300.00

DAM NO. 25, MISSISSIPPI RIVER

OWNER: U. S. War Department; Lt. Col. P. S. Reinecke, District Engineer, St. Louis, Mo.

PROJECT: Construction of Dam No. 25 as part of the upper Mississippi navigation system, near Cap au Gris, Mo., 61.5 miles above St. Louis.

BIDS: Five bids were opened May 18, 1937, ranging fro the contract low of $3,383,460 to a high of $3,750,631.

CONDITIONS: Completion is scheduled for 810 days aft contract award; wage rates specified.

LOW BIDDERS:

1.	United Construction Co. (contract) Winona, Minn.	$3.383.460
2.	Central Engineering Co. Davenport, Ia.....	3.523.411
3.	Warner Construction Co. Chicago, Ill.....	3.574.915

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Cofferdam	1,333 l. f.	$337.84	$328.00	$414.00
2. Excav., to 50,000 c. y	50,000 c. y.	.01	.26	1.12
3. Excav, to 75,000 c. y	25,000 c. y.	.01	.35	.105
4. Excav., to 100,000 c. y.	25,000 c. y.	.01	.34	.105
5. Excav. plus item 4	25,000 c. y.	.01	.32	.105
6. Fill, to 25,000 c. y	25,000 c. y.	.10	.31	.475
7. Fill, to 50,000 c. y	25,000 c. y.	.10	.30	.16
8. Fill, to 75,000 c. y	25,000 c. y.	.08	.29	.16
9. Fill, to 100,000 c. y	25,000 c. y.	.08	.28	.16
10. Fill, to 125,000 c. y	25,000 c. y.	.06	.27	.16
11. Fill, plus item 10	25,000 c. y.	.06	.26	.16
12. Embankment, dike	100,000 c. y.	.21	.36	.487
13. Embankment, plusitem 12.	25,000 c. y.	.10	.35	.24
14. Embankment, plusitem 13.	25,000 c. y.	.08	.34	.24
15. Embankment, plusitem 14.	25,000 c. y.	.06	.32	.24
16. Embankment, plus item 15.	25,000 c. y.	.06	.31	.24
17. Pile, timber	212,730 c. y.	.70	.63	.55
18. Pile, concrete	3,000 c. y.	1.68	3.05	4.15
19. Pile, steel sheet, MA-31	70,000 s. f.	1.64	1.39	1.45
20. Pile, steel sheet, MA-22.	45,250 s. f.	1.23	1.18	1.20
21. Pile, steel sheet, MA-22U	119,600 s. f.	.60	.88	.79
22. Pile, steel sheet, Z-38	5,700 s. f.	2.10	1.67	1.81
23. Pile loading test	5 each	603.50	575.00	1,950.00
24. Timber, soft wood, creosoted.	4.8 M.b.m.	300.00	175.00	600.00
25. Lumber, mattress	297 M.b.m.	80.00	85.00	75.00
26. Stone protection, derrick	10,700 c. y.	5.00	5.75	5.15
27. Stone protect. 1 & 2 man.	16,500 c. y.	4.30	5.25	6.10
28. Stone protect. rip rap	3,130 c y.	4.00	3.75	4.57
29. Stone protect. gravel	6,820 c. y	2.52	2.95	4.52
30. Stone protect. stored	5,000 c. y.	3.23	4.50	4.80
31. Stone protect. rehandled	2,500 c. y.	.75	.75	2.46
32. Concrete, slushing	1,290 c. y.	20.75	9.75	20.00
33. Concrete, Cl. A	1,920 c. y	27.37	24.50	20.00
34. Concrete, Cl. B	48,900 c. y.	12.63	14.75	12.42
35. Struc. steel, serv. bridge	1,775,000 lb.	.084	.09	.08
36. Struc. steel, tainter gate	3,027,000 lb.	.091	.096	.096
37. Struc. steel, roller gate	482,500 lb.	.105	.119	.12
38. Struc. steel, phos. chro., gate	580,500 lb.	.137	.116	.12
39. Struct. steel, misc	1,067,000 lb.	.105	.08	.092
40. Struct. steel, high tensile	359,500 lb.	.13	093	.10
41. Struct. steel, phos. chro	277,400 lb.	.105	.079	.08
42. Struct. steel, nickel	147 lb.	.21	.56	.56
43. Steel, conc. reinf	1,283,000 lb.	.065	.05	.062
44. Steel, corr. resisting	71,400 lb.	.75	.614	.614
45. Steel, cold rolled	912 lb.	.17	.126	.13
46. Forgings, steel	57,100 lb.	.14	.145	.165
47. Forgings, alloy steel	130,800 lb.	.20	.176	.176
48. Forgings, phos-chro. steel	20,300 lb.	.245	.338	.36
49. Castings, steel, Cl. O	22,100 lb.	.15	.118	.133
50. Castings, steel, Cl. 1-3	508,800 lb.	.225	.209	.21
51. Castings, alloy steel	99,100 lb.	.315	.214	.214
52. Bronze	21,700 lb.	.57	.579	.58
53. Copper	5,300 lb.	1.05	.75	.60
54. Non-ferrous metals, misc	620 lb.	.42	.373	.38
55. Steel pipe, bl. std. 2 in	220 l. f.	.75	.75	2.50
56. W. I. pipe, bl. std. 4 in	260 l. f.	3.10	2.50	3.00
57. Conduit, fiber, 4 in	142 l. f.	.60	1.20	1.08
58. Conduit, fiber, 2 in	375 l. f.	.53	.65	.90
59. Conduit, metal, 4 in	47 l. f.	6.00	1.75	3.13
60. Conduit, metal, 3 in	141 l. f.	4.13	1.20	2.18
61. Conduit, metal, 2 in	42 l. f.	3.00	1.00	1.51
62. Conduit, metal, 1½ in	1,014 l. f.	1.50	.75	1.04
63. Conduit, metal, 1¼ in	16 l. f.	1.95	.65	1.04
64. Conduit, metal, 1 in	51 l. f.	1.50	.60	.97
65. Electrical grounding system	total	263.00	475.00	247.00
66. Crane track, 80 lb. rail	1,518 t. f.	3.75	6.84	6.84
67. Storage yd. track, 60.5 lb	392 t. f.	3.10	4.19	4.20
68. Handrail, steel pipe, 2 in	2,215 l. f.	2.55	3.30	3.30
69. Post, safety chain	6 each	24.00	32.80	65.00
70. Floor grating, steel, 1 in	110 s. f.	1.60	1.73	2.73
71. Floor grating, steel, 1¼ in	3,230 s. f.	1.47	1.50	1.50
72. Floor plate, ¼ in	720 s. f.	1.15	1.10	1.10
73. Floor plate, 5/16 in	17,400 s. f.	1.15	1.02	1.02
74. Rubber seals, moulded	17,800 lb.	.84	1.06	1.06
75. Rope, cotton	330 lb.	.84	1.06	1.06
76. Operat. machinery, roller gate	3 ea.	33,000.00	28,636.00	28,636.00
77. Roller gate spare parts	L. S.	5,985.00	3,990.00	3,990.00
78. Roller gate operat. machinery	L. S.	14,910.00	11,500.00	11,500.00
79. Roller gate operat. house	4 ea.	4,800.00	5,500.00	4,650.00
80. Operat. machinery, tainter gate	14 ea.	19,000.00	19,380.00	19,380.00
81. Tainter gate operat'g. machinery	total	12,075.00	11,440.00	11,440.00
82. Gate heaters, tainter, complete	total	.630.00	450.00	450.00
83. Gate heaters, roller, complete	total	3,990.00	3,810.00	3,810.00
84. Gate heater, spare parts	total	525.00	800.00	800.00
85. Install locomotive train	total	1,000.00	1,500.00	1,825.00
86. Install trucks in stor. yd	total	100.00	150.00	115.00
87. Store pick-up booms	total	25.00	25.00	10.00
88. Superstructure, Pier 21	total	4,743.00	5,775.00	6,000.00
89. Pressure grouting, mortar	1,500 c. y.	1.00	1.75	3.45
90. Temp. storage bldg	total	500.00	275.00	1,135.00

NEW AIDS TO THE CONSTRUCTOR

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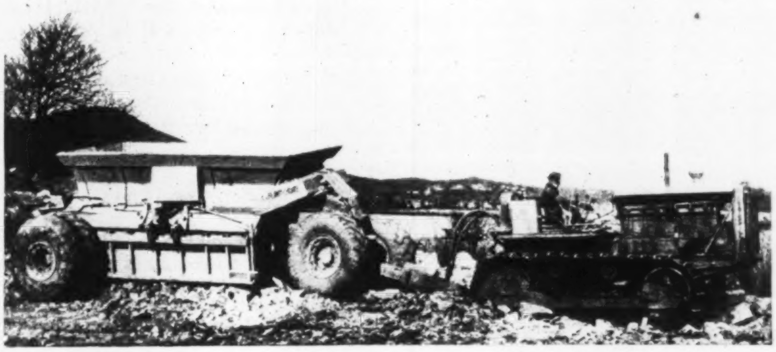

Rubber-Wheeled Dump Wagon

Rubber wheels are featured on a new 19-yd. dump wagon made by the LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa. The wagon, shown in the accompanying illustration, is the bottom-dump type with a hydraulic door-closing mechanism. The same lever, located on the tractor, shifts the doors and operates the brakes so that one man can handle all of the operation. The power for the hydraulic mechanism is taken from the power shaft of the tractor. The makers point out that a full load flattens the tires so that the actual ground area under each is 420 sq.in., giving a total of 18 sq.ft. under the load. Because of the nature of rubber tires, the load on each wheel is distributed evenly over this area.

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Mineral Insulating Product

A building material said to have high insulating and acoustical values and at the same time be fireproof, moisture-proof, vermin-proof, and impervious to decay, was recently put on the market by the Mikolite Co., Kansas City. Mikolite is produced by placing a micacious mineral ore under 2,000 deg. F. of heat for 15 sec. At this point the ore which weighs 80 lb. per cu.ft., expands to as much as twenty times its original size, making the density from 7 to 12 lb. per cu.ft. In this state it becomes cork-like and porous.

It is claimed that Mikolite is the only known micacious mineral capable of withstanding mixing action without breaking down and having an affinity for binders, such as cement, gypsum and asphaltum.

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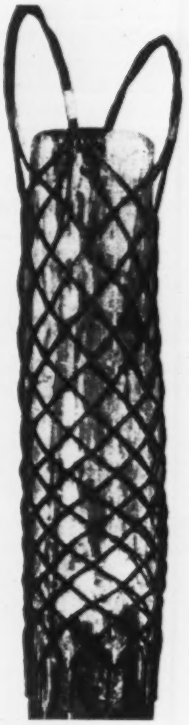
Highway Expansion Strip

Effective sealing against moisture and temperature changes and reduced noise are advantages claimed for the new Goodrich expansion strip for joints in concrete highways, illustrated in the accompanying photograph. Goodrich research and development men state that the material is economical and easily applied. Test installations have been made in Ohio, Indiana, Michigan and District of Columbia, and the material is now being applied in Tennessee, Mississippi, Louisiana, Georgia and North Carolina.



Pile Puller

This cable grip for use in pulling piles, made by Kellems Products, Inc., 1911 Park Ave., New York City, has a tensile strength of over 200,000 lb. It is made of ⅜ in. improved plow steel rope and will pull piles from 14 in. to 18 in. in diameter. It is flexible and will conform to any bumps or uneven surfaces on the piling, and, since it secures traction on a minimum of 4 ft. of the piling, it will extract quite badly decayed piles, it is said, with little breakage.

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Activated Carbon Valuator

Darco Corp., 60 East 42d St., New York, has developed a method of evaluating activated decolorizing carbon, called the Darco Graph. The Darco Graph consists of a sheet of specially ruled graph paper, and a scale rule. An instruction book that accompanies the Darco Graph shows how it is used to determine required dosage, check uniformity of deliveries and evaluate carbon directly.

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Shaft Drill Jumbo

A drill jumbo for sinking shafts, essentially a portable mounting for six pneumatic feed drifters, has recently been put on the market by the Worthington Pump & Machinery Corp. The Jumbo, illustrated in the accompanying diagram, is lowered to its operating position within the shaft where it is axially anchored to the wall by three radially mounted trunnion arms, each equipped at its outer end with an adjustable mining foot-piece. The pneumatic feed drifters are then adjusted for drilling. When a set of holes has been drilled, the Jumbo is contracted to a collapsed position and is hoisted out of the shaft during the operation of loading, shooting and mucking.

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Parsons Disc Roller

In the issue of June 17, p. 25, it was erroneously stated that the Parsons disc tamping roller, manufactured by the Parsons Co., Newton, Iowa, was manufactured in Newton, Ohio.

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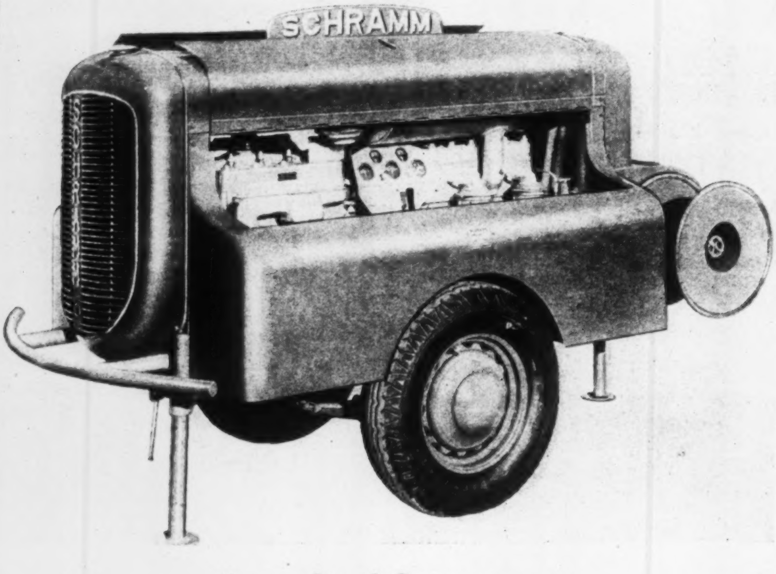
Wrong Photographs

We have been advised by the Truscon Laboratories that they included the wrong photograph in their advertisement which appeared in the May 20 issue of *Engineering News-Record*. Truscon Mortite was not used in the new federal buildings there shown.



Streamlined Compressor

Light weight and a modern trend in design characterize a new air compressor manufactured by Schramm, Inc., West Chester, Pa. Two of the standard Schramm "Utility" models have been engineered into a de luxe air compressor for users who recognize the need for a compact, light weight, portable air compressor. Gasoline-engine driven machines are available in sizes 85 and 105 cu.ft. actual air delivery, and a diesel-powered unit is made in the 105-cu.ft. size. De luxe "Utility" is a complete air plant with air and gas tank under the hood.

Compressor features include 4-cylinder, vertical block with lighter pistons; five main bearings; force feed lubrication supplied by gear-driven oil pumps to all movable parts; mechanical intake valves operated from camshaft in perfect timing with piston travel; electric self-starting; and a Schramm self-aligning clutch which connects the 4 cylinder engine with the air compressor.

MANUFACTURERS' ACTIVITIES

Plant Expansion

Phelps - Dodge · Copper Products Corp. has awarded the Austin Co. a contract for the erection of an addition to the plant of the Habirshaw Cable and Wire Division, at Yonkers, N. Y. The new plant will make all types of insulated power cables used by public utilities and industrial companies, and it will more than double the Habirshaw facilities.

Worthington Pump & Machinery Corp. is reopening its Holyoke, Mass., plant which has been idle since 1932. Operations will begin with the production of portable compressors, contractors' air tools, rock drills and air-conditioning equipment.

Johns-Manville Products Corp. has recently acquired property in Watson, Calif., a suburb of Los Angeles, and in Richmond, Ind. In Watson construction will soon begin on a new plant in which rock wool home insulation and Transite asbestos-cement pipe will be produced. The Richmond property, a plant purchased from the Fibre Conduit Co., will be used to manufacture a new type of low temperature insulation recently perfected by Johns-Manville.

New distributors

G. N. Crawford Co., 405 Penn Ave., Pittsburgh, and Fred E. Marshall, Seaboard Park, Columbia, S. C., are new distributors for the O.K. Clutch & Machinery Co., Columbia, Pa., in the Pittsburgh and the South Carolina districts.

P&H Cranes, hoists and electric motors will be distributed throughout Minnesota and North and South Dakota by the Lloyd B. Edwards Co., 840 Lumber Exchange Building, Minneapolis, the Harnischfeger Corp., Milwaukee, Wis., has announced. The Northern Machinery & Supply Co. formerly had this agency.

New Personnel

Earth-Moving projects throughout the country will be visited by members of the new promotional engineering department of the R. G. Letourneau, Inc., Peoria, Ill. This department, under the direction of Kenneth F. Park, will accumulate a fund of data on construction practices and will also develop new applications for Letourneau equipment.

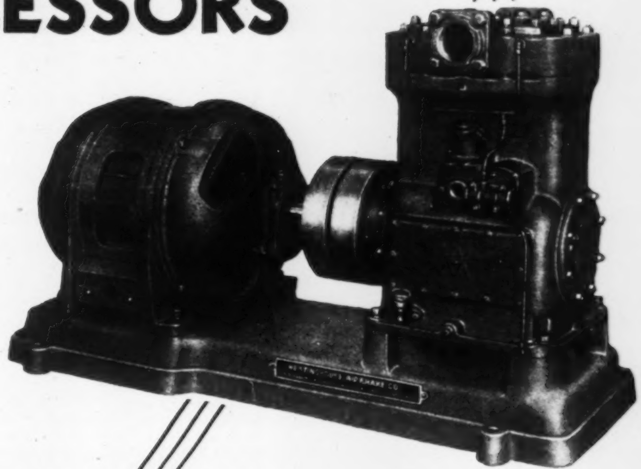
Fred H. Brune of the Rensselaer Valve Co., formerly Pacific Coast sales agent, has been promoted to sales manager of the Middle West territory with headquarters in Chicago, Ill. A. E. Jones, who is retiring after 45 years of service in the company, formerly held this post.

Richard W. Dinzl, formerly in charge of engineering for the Southwark show-division of the Baldwin-Southwark Co., is now chief engineer of the Watson-Stillman Co., Roselle, N. J.

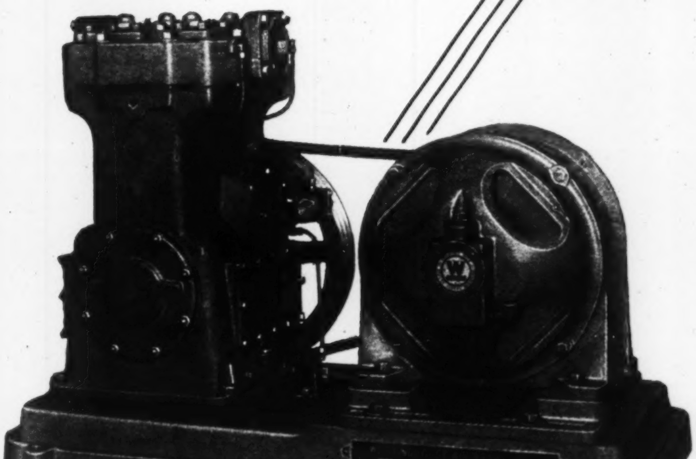
Link-Belt Co., Chicago, has appointed Erwin A. Wendell district sales manager in the St. Louis territory. He will be located at 317 No. 11th St., St. Louis.

Welding Experience is brought to West Coast users of welding with the appointment of William F. Fischer to the sales staff of the Lincoln Electric Co.'s San Francisco office, 866 Folsom St. Mr. Fischer comes to his new position after five years' extensive experience in the welding field.

Announcing a NEW *Line of* AIR COMPRESSORS TYPE "Z" » »



TWO cylinder, single stage moderate speed, water-cooled type for continuous operation against pressures up to 125 pounds . . . Its lubricating system is of the pressure type, and interlocked with a positive unloader so that no air can be compressed if oil supply is low . . . It has quiet, efficient disc valves, and crank shaft is mounted on ball bearings.



Furnished with or without coupling, or as a complete belt or direct connected motor driven unit, mounted on a bed plate. Available in sizes ranging from 46 to 157 cu. ft. displacement. Greater displacements up to 314 cu. ft. may be had by a combination of two compressors, with a double fly wheel, driven by one motor . . . These compressors are compact, efficient, and durable. Long trouble-free service is assured. » » » » »

WESTINGHOUSE AIR BRAKE CO.

Industrial Division **Pittsburgh, Pa.**

(Contract Unit Prices continued from adv. page.)

BUNKER AND WHARF, CAL.

OWNER: U. S. War Department, San Francisco, Calif.

PROJECT: Construction of reinforced concrete abutment, wharf and approach including relocation of coal bunker and removal and disposal of existing wharf in Horseshoe Bay at Fort Baker, Marin Co. Calif.

BIDS: Two bids were received May 28, 1937 ranging from a low of $209,794 to a high of $227,807 as compared with the engineers estimate of $156,799 and the appropriation of $130,000.

CONDITIONS: Contractor furnishes all labor and material required for the completion of the project which is scheduled for 180 days after contract award.

LOW BIDDERS:

1. Duncanson—Harrelson Co. San Francisco... $209,794
2. A. W. Kitchen & Co. San Francisco......... 227,807
3. Engineers estimate 156,799

Item	Quan.	Unit Prices		
1. Move, reset bunker, tel. pole	l. s.	$650.00	$516.00	$1,025.00
2. Remove fender piles, wharf deck	l. s.	2,200.00	10,153.00	5,800.00
3. Pull concrete piles	22 ea.	64.50	40.00	40.00
4. Cut concrete piles	22 ea.	75.00	62.50	54.00
5. Excav., struct	220 c. y.	6.10	15.00	5.00
6. Backfill	250 c. y.	1.65	1.75	1.00
7. Conc. cl. A, waterproofing	1,470 c. y.	20.00	22.75	15.50
8. Reinf. steel	217,000 ib.	.065	.053	.05
9. Concrete piles	23,000 l. f.	4.14	3.92	3.00
10. Conc. piles, rock anchorage	2,350 l. f.	5.10	12.00	4.00
11. Wood piles, creosoted	7,450 l. f.	1.10	.94	.80
12. Creosoted timber	39 M.b.m.	130.00	146.60	90.00
13. R. R. track, fittings	23,000 lb.	.173	.198	.12
14. Steel shoes, piles	389 ea.	6.50	6.32	5.00
15. Misc. hdw. bolts, washers	13,000 ib.	.09	.068	.08
16. Struct. steel plate, washers	1,660 ib.	.06	.078	.05
17. Corros. proof steel bolts	150 lb.	1.20	1.10	.20
18. C. I. shoes, conc. piles	67 ea.	8.00	7.70	6.00
19. C. I. mooring bits	7 ea.	120.00	116.00	130.00
20. C. I. mooring cleats	8 ea.	61.00	58.00	70.00
21. C. I. washers, spec	2,300 lb.	.29	.34	.10
22. Fibre conduit	870 l. f.	.32	.58	.20
23. Metal conduit	70 l. f.	2.20	1.90	.20
24. Junct. box, type A	3 ea.	40.00	45.00	5.00
25. Junct. box, type B	5 ea.	33.00	28.00	5.00
26. Asphalt conc. pavement	29,700 s. f.	.20	.153	.10
27. Conc. batter piles	4,200 l. f.	5.00	4.50	3.10

HIGHWAY SURFACING, WASHINGTON

OWNER: State Highway Department, Washington; L. V. Murrow, Director.

PROJECT: Draining, grading and surfacing with crushed stone 3.28 miles of 20 ft. roadway on State Road No. 3, Whitman County.

BIDS: Ten bids ranged from contract low of $53,367 to a high of $76,350, with work awarded after May 18 opening.

CONDITIONS: Completion is scheduled for 120 days after contract award, with the contractor furnishing all labor and material required for the work.

LOW BIDDERS:

1. F. H. Deatley, Lewiston, Idaho (contract)... $53,367
2. Guy J. Norris, Colfax, Wash................ 56,994
3. Roy L. Bair, Spokane, Wash.................. 57,794

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Clear. grub	L. S.	$200.00	$225.00	$500.00
2. Excav. Cl. A	67,270 c. y.	0.17	0.18	0.17
3. Excav. rock	60 c. y.	2.00	1.25	1.20
4. Excav. struct	710 c. y.	.75	1.00	1.00
5. Excav. Cl. D	750 c. y.	.75	.50	.50
6. Overhaul, sta. yd	67,390 c. y.	.02	.015	.01
7. Overhaul, yd. mile	2,580 c. y.	.20	.15	.15
8. Slope treatment	19,440 l. f.	.06	.09	.06
9. Finish roadway	173.9	5.00	5.00	4.00
10. Stone surf., top course	2,900 c. y.	$1.00	$1.20	$1.20
11. Stone surf., base course	5,300 c. y.	1.00	1.20	1.20
12. Stone surf., sub-base	18,150 c. y.	.85	1.00	1.15
13. Stone surf., top stackpile	1,260 c. y.	1.00	1.00	.90
14. Stone surf., sub-base stack	1,500 c. y.	.90	1.00	.80
15. Coarse screenings	2,100 c. y.	1.40	1.20	1.20
16. Fine screenings	480 c. y.	2.00	1.20	1.20
17. Water in place on rdwy	332 M-gals.	2.00	2.00	2.00
18. Conc. Cl. C	5.11 c. y.	30.00	30.00	28.00
19. Cl. riprap	50 c. y.	8.00	4.00	3.00
20. Reinf. conc. fed. aid markers	2 each	10.00	10.00	10.00
21. Reinf. conc. P/W markers	75 each	2.00	2.00	2.00
22. Remove wood guard rail	240 l. f.	.20	.25	.20
23. Remove tbr. & lbr. ditch coverings	L. S.	50.00	10.00	50.00
24. Remove conc. pipe headers	34 each	2.00	5.00	3.00
25. Relay corr. iron pipe, 18 in.	27 l. f.	.50	.50	.50
26. Relay conc. iron pipe, 18 in.	96 l. f.	.75	.60	.60
27. Relay conc. iron pipe, 24 in.	36 l. f.	.75	.75	.80
28. Relay conc. iron pipe, 36 in.	96 l. f.	1.00	1.25	1.20
29. Pl. conc pipe, 12 in	87 l. f.	1.35	1.00	1.10
30. Pl. conc. pipe, 18 in	99 l. f.	2.25	2.00	2.00
31. Std. reinf. conc. pipe, 18 in.	687 l. f.	2.50	2.20	2.20
32. Std. reinf. conc. pipe, 24 in.	396 l. f.	3.75	3.15	3.20
33. Std. reinf. conc. pipe, 30 in.	45 l. f.	6.00	4.50	4.60
34. Std. reinf. conc. pipe, 48 in.	24 l. f.	12.00	10.00	11.00
35. Ex. Str reinf. conc. pipe, 48 in	44 l. f.	14.00	11.50	12.50

HIGHWAY UNDERPASS, STOCKTON, CALIFORNIA

OWNER: State Highway Commission, San Joaquin Co., Calif.

PROJECT: Construction of undergrade crossing under the A.T. & S.F.R.R. at Wilson Way in Stockton, Calif., consisting of structural steel and concrete underpass and 0.29 mi. of concrete and asphalt approaches.

BIDS: Opened May 19, 1937; minimum hourly wage rates stipulated at $1.00 for skilled and 60c for common labor.

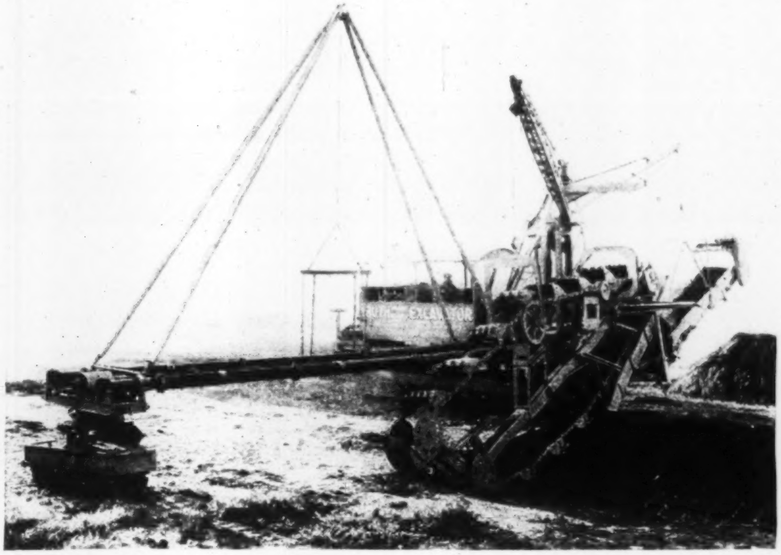
LOW BIDDERS:

1. Earl W. Heple, San Jose, Calif............. $212,365
2. United Concrete Pipe Co., Los Angeles, Calif. 216,734
3. Lord & Bishop, Sacramento, Calif........... 219,833

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Remove, dispose conc.	2,000 c. y.	$1.25	$1.55	$1.25
2. Excav. uncl., roadway	33,000 c. y.	.50	.56	.60
3. Excav. struct	10,000 c. y.	.85	1.25	1.00
4. Imported borrow	8,000 c. y.	1.00	.80	1.00
5. Subgrade, pavt	15,600 s. y.	.10	.15	.20
6. Liq. asphalt SC-1A	6 ton	25.00	40.00	25.00
7. Asphalt, Gr. E., subgrade	9 ton	40.00	40.00	30.00
8. Ashpalt conc	3,550 ton	6.00	5.00	6.25
9. Asphalt paint binder	1,000 s. y.	.10	.05	.05
10. Salvaged surf	100 c. y.	2.00	1.50	1.50
11. Port. cem. conc. Cl. A., pav't.	1,270 c. y.	9.50	9.60	10.50
12. Pavt. dowels	2,400 ea.	.20	.12	.25
13. Bar reinf. steel	317,000 lb.	.05	.05	.05
14. Port cem. conc. Cl. A., struct.	3,250 c. y.	15.00	14.00	16.00
15. Port cem. conc. Cl. A., railing	70 c. y.	50.00	75.00	60.00
16. Struct. steel	352,000 lb.	.075	.073	.07
17. Wrought-iron plate	82,000 lb.	.10	.12	.08
18. Stand. reinf. conc. pipe, 30 in	1,014 l. f.	3.50	4.50	4.00
19. Cor. metal pipe, 8 in	920 l. f.	1.00	.90	1.00
20. Cor. metal pipe, 10 in	96 l. f.	1.25	1.00	1.10
21. Cor. metal pipe, 12 in	94 l. f.	1.50	1.20	1.25
22. Perf. metal pipe, 8 in	2,480 l. f.	1.00	.80	1.00
23. Rock filling material	170 c. y.	2.25	3.50	2.00
24. Vit. clay pipe, 4 in	710 l. f.	.30	.40	.25
25. Vit. clay pipe, 6 in	572 l. f.	.40	.40	.35
26. Vit. clay pipe, 8 in	150 l. f.	.50	.45	.50
27. Vit. clay pipe, 12 in	884 l. f.	.90	.75	1.00
28. Conc. pipe, 8 in	426 l. f.	.50	.40	.45
29. Conc. pipe, 10 in	304 l. f.	.65	.55	.75
30. Conc. Cl. A. misc	1,100 c. y.	13.50	14.00	12.00
31. Pipe, 3 in	70 l. f.	.80	1.00	.60
32. CI pipe	6 l. f.	10.00	6.00	6.00
33. Copper strips	1,300 lb.	.50	.50	.50
34. Protective cover	21 c. y.	13.00	20.00	20.00
35. Lamp poles	2 ea.	25.00	10.00	5.00
36. Brick manholes, 4 in	5 ea.	25.00	50.00	80.00
37. Brick manholes, 5 in	4 ea.	75.00	60.00	90.00
38. Adjust exist. manholes	6 ea.	25.00	10.00	20.00
39. Cast steel	3,900 lb.	.30	.20	.30
40. Cast iron	2,350 lb.	.12	.15	.15
41. Waterproofing	300 s. y.	.30	1.50	.40
42. Pump. equip. (lump sum)		2,000.00	2,500.00	2,200.00
43. Lighting equip. (lump sum)		6,500.00	7,000.00	5,000.00
44. Misc. items, work (lump sum)		1,000.00	2,000.00	1,000.00

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Multi-Bucket Excavator

Digging and flexibility are features of the new Ruth multi-bucket excavator, manufactured by the Ruth Dredger Manufacturing Corp., 5980 S. Boyle Ave., Los Angeles. This excavator is designed for digging and excavating drainage and irrigation canals and ditches as well as for their maintenance, and for levee building and highway construction. It has eight forward speeds, two in reverse and four speeds for digging with the elevators.

Enclosed speeds of the caterpillar crawlers, synchronized with the digging speeds of the excavating units results in a constantly maintained digging depth. The buckets have a patented positive-dump feature which ejects the entire contents of each load, and the cutting teeth and the cutting lips are of high abrasive-resisting steel. The powered extension crawler is turnable.

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EQUIPMENT IN BRIEF

A **Crusher** that weighs half as much as old style crushers of the same size is Pioneer's latest contribution to the crusher industry. The new Pioneer 24-36 jaw crusher weighs 32,000 lb. whereas the old 24-in. by 36-in. Blake-type crusher weighed between 60,000 and 80,000 lb. Another feature of this new model is the overhead eccentric for which the following advantages are claimed: force-feed action, double crushing stroke, simpler construction, easier adjustment and greater capacity.

The Linde Air Products Co. of New York City has announced two new pieces of oxy-acetylene equipment. Oxweld MP-7 is an acetylene generator which will operate any number or type of oxy-acetylene welding or cutting blowpipes requiring up to 100 cu. ft. of acetylene per hour. It will maintain constant pressure on the acetylene line; hence no additional regluator is needed with the MP-7. It is of the medium pressure type for portable or stationary use, and its all-welded steel housing makes it especially rugged and dependable.

A portable cutting machine, Oxweld CM-16, is a motor-driven device which applies an oxy-acetylene flame for the shape cutting of steel parts up to 4 in. in thickness. It may be used with a radius rod for cutting circles, on an angle iron track for automatic straight-line cutting, or it may be guided by hand for cutting irregular shapes to exact contour. Its weights is 45 lb. complete with blowpipe.

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Industrial Battery

USL Durapak is a new battery manufactured by the USL Battery Corp., Niagara Falls. It is designed for use in industrial trucks, electric locomotives, battery-propelled street trucks, railroad car lighting and air conditioning service. This new product is said to possess a number of construction features, all of which have been tried and proven, but never before combined in one battery. The major features are an improved positive plate, long life, "Permatex" separators to balance the long service life of the positive plate, improved negative plates with vapor tops and insulated edges for extra protection against short circuiting.

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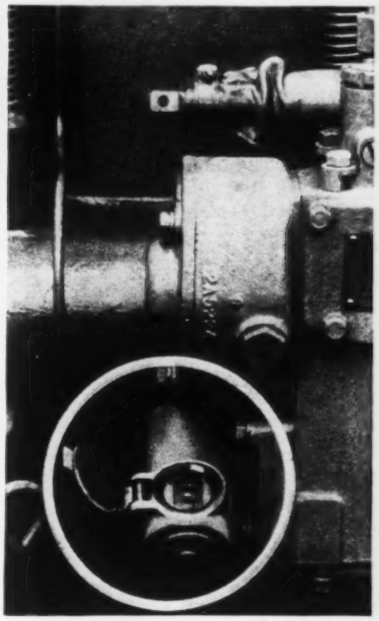
Diesel Hour Meter

An hour meter, shown in the accompanying illustration, is now a standard feature of all 3-, 4- and 6-cylinder diesel engines produced by the Caterpillar Tractor Co. The hour meter is attached to the rear of the fuel injection pump housing and is driven by the end of the shaft. It registers one number for every hour the engine operates at standard rate of speed.



MANUFACTURERS' ACTIVITIES

New distributors

General Engineering Equipment Co., 578 Century Building, Indianapolis, is now representing the Pennsylvania Pump & Compressor Co. of Easton, Pa., in the Indianapolis district.

E. J. Gove has been placed in charge of a new Cutler-Hammer office at 1106 Central Tower, Youngstown, Ohio. The new office is a branch of **Cutler-Hammer's** Pittsburgh office.

Frick Reid Supply Corp., 117 Santa Fe St., N.S., Pittsburgh, has been appointed agent for the Harnischfeger Corp., Milwaukee, in western Pennsylvania and northern West Virginia. The Frick Reid Supply Corp. has supply houses at Clarksburg, W. Va., Bradford, Pa., and Marietta, Ohio.

Plant Expansion

Glass Making will be more automatic than before with the completion of construction of a new industrial plant for the manufacture of glass building units at Port Allegheny, Pa., built by the Pittsburgh-Corning Corporation. The designing of novel automatic machinery and of sealing equipment for the manufacture of glass building units has made this project possible.

Completion of mill additions and equipment improvements involving expenditures of approximately $200,000 have been announced by the Vermont Asbestos Corp., owned by a subsidiary of the Rubberoid Co. and operating at Eden, Vt. The improvements have doubled the output of the mill and made possible production of grades of asbestos fibre not heretofore recovered.

Business Increases in 1936 have made it necessary for the White Motor Co. to map out an expansion program calling for the expenditure of more than $2,000,000 within the next year and a half. This program calls for building construction, machinery, tools, general property improvement and creation of a new heavy-duty bus body building division. The program is expected to boost production schedules 50 per cent in order to meet demand and to relieve pressure on plants now geared to capacity.

Bethlehem Steel Co. will soon begin construction on a four-strand rod and bar mill in connection with its Maryland plant at Sparrows Point, Md. Plans also include increased wire drawing and increased capacities. In the high-speed, four-strand mill, four billets, rather than two as in the present two-strand mill, can be passed through the roll stands at one time.

New Personnel

J. J. Summersby, assistant vice-president of Worthington Pump & Machinery Corp., has been appointed general sales manager of that corporation.

Rensselaer Valley Co., Troy, N. Y., has brought E. A. Rutledge from the company's Los Angeles branch to Troy to become research engineer.

William F. Lockhardt has been elected vice-president in charge of sales of the Vacuum Concrete Corp., 30 Rockefeller Plaza, New York. Mr. Lockhardt was formerly New York assistant district manager of the Portland Cement Association.

Louis B. Neumiller has been appointed sales manager of the Caterpillar Tractor Co.'s newly created central sales division. The central sales division is a sales area created by the division of the United States into three sales areas instead of the former two. It includes roughly the territory lying between the Rocky Mountains and the Mississippi.

NEW PUBLICATIONS

An Illustrated catalog, "Catalog No. 67," of fluted steel shells, for cast-in-place concrete piles, has been issued by the Union Metal Manufacturing Co., Canton, Ohio. Descriptions of installation methods and specifications for various length pile shells are included.

Sparling main line water measuring equipment is cataloged in the 20 loose-leaf pages of "Bulletin 304" of R. W. Sparling, 945 North Main St., Los Angeles, Calif.

Structural uses of and specifications for "Manganese-Vanadium Steel" are given in a booklet of that name published by the Vanadium Corporation of America, 420 Lexington Ave., New York City.

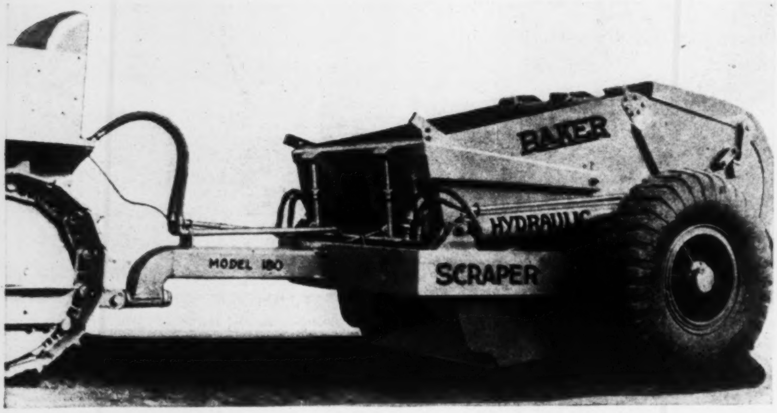
"**Modern Methods** of Moving Earth" are discussed from a cost and technical point of view, and profusely illustrated, in an 80-page booklet of that name issued by the Cleveland Tractor Co., Cleveland, Ohio.

Wheels manufactured by the Geneva Metal Wheel Co., Geneva, Ohio, are listed in "Catalog No. 20." A handy tab index makes the use of this attractive catalog easy.

Electrical and mechanical flow meters manufactured by the Brown Instrument Co., are attractively described in "Catalog No. 2004," illustrated in colors.

Photographs depicting many uses for sheet metal in a wide variety of applications are featured in a 20-page booklet "The Path to Sheet Metal Permanence," along with information on the properties of Toncan Iron sheet metal, by the Republic Steel Corp., of Cleveland.

A **Pocket Size** handbook of "Common Machine Fasteners" has been published by the Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y. In 20 pages it shows 26 illustrations of the accepted standard method of drawing various types of bolts, nuts, and rivets.



New Scraper Uses Hi-Steel

Baker Mfg. Co., Springfield, Ill., is manufacturing a new 5-yd. hydraulic scraper, for which they claim great strength with light weight. This light weight has been made possible by the employment of Hi-steel in its construction. Hi-steel is considerably stronger than carbon steel. Because of its light weight, and other draft reducing features, the Baker hydraulic scraper can be loaded to capacity and hauled by a 35-hp. tractor. The lowering and raising of the pan is accomplished by twin hydraulic cylinders located over the side frame members. The hydraulic pump is directly connected to the engine transmission of the tractor, with control from the tractor driver's seat. The scraper can be backed up and dumped over the edge of a fill, at bridge abutments or in a deep depression.

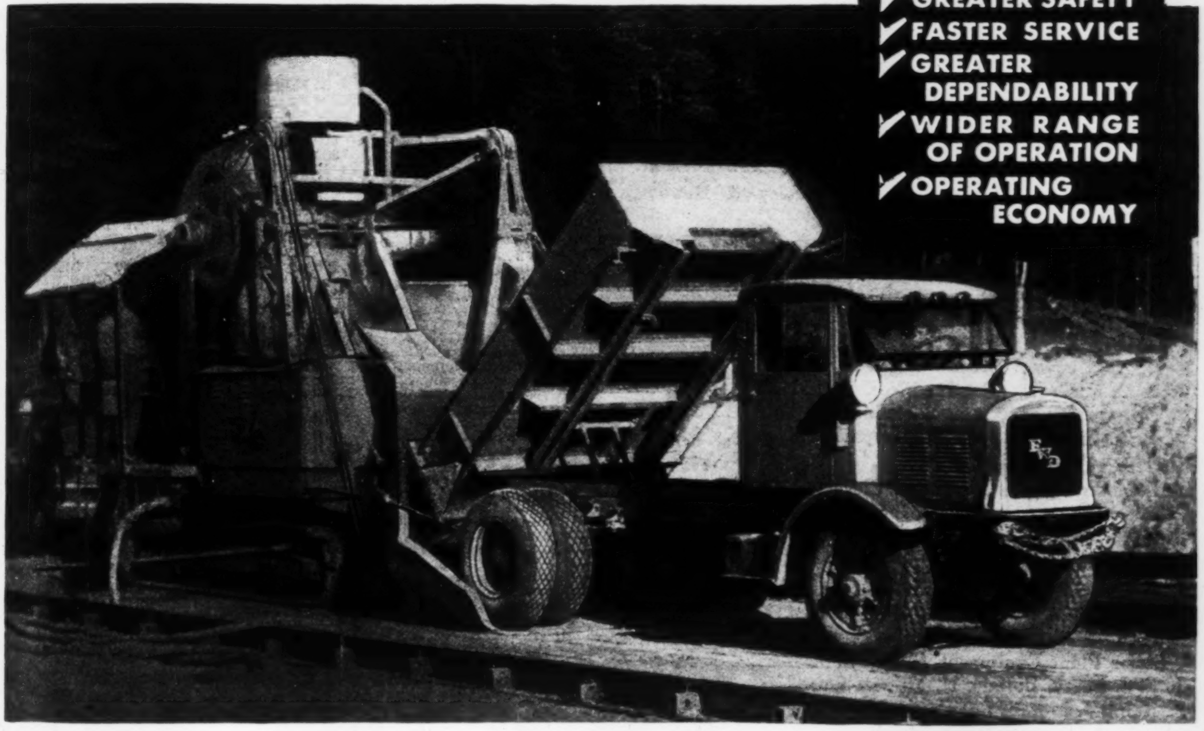
Controlled Power

Enables the FWD Truck to get "IN" and "OUT" of Tough Going

In mud—sand—loose soils—and on slippery pavements—the FWD Truck has won a world-wide reputation for dependable service, distinctly its own. Its famous four-wheel-drive principle—that of equalized power and load distribution—gives it the *positive traction* so essential in road building and maintenance. In FWD design, a center differential is used to distribute the power equally to all *four* driving wheels. There's ample reserve power — rugged construction throughout — and a truly dependable refinement of the four-wheel-drive principle, insuring continuous operation even in the hardest, toughest going. You'll get "in" and get "out" on any job with speed, safety, and economy with FWD — the pioneer Four Wheel Drive Truck. *Write us for special highway service booklet.*

FWD Controlled Power Gives You

- ✓ GREATER SAFETY
- ✓ FASTER SERVICE
- ✓ GREATER DEPENDABILITY
- ✓ WIDER RANGE OF OPERATION
- ✓ OPERATING ECONOMY



FWD

THE FOUR WHEEL DRIVE AUTO CO.
CLINTONVILLE, WISCONSIN
Canadian Factory, KITCHENER, ONTARIO

FOUR-WHEEL-DRIVE TRUCKS

FOR DEPENDABLE AND ECONOMICAL PERFORMANCE

(*Contract Unit Prices continued from page 162*)

HIGHWAY SURFACING, ARIZONA

OWNER: U.S. Bureau Public Roads; C. H. Sweetser, district engineer.

PROJECT: Bitumen coating 13.264 mi. of 22 ft. roadway in Kaibab National Forest, Coconino Co., Arizona.

BIDS: Three bids were opened June 8, 1937 ranging from a low of $28,822 to a high of $41,469.

CONDITIONS: Minimum hourly wage rates are stipulated of $1.00 for skilled and 50 c. for common labor, with all asphalt materials required in the construction to be furnished by the government.

LOW BIDDERS:

1. Arizona Sand & Rock Co. Phoenix, Ariz.	$28,822
2. Skousen Bros. Albuquerque, N. M.	40,089
3. Tiffany Const. Co., Phoenix, Ariz.	41,469

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excavation, uncl.	100 c. y.	$0.95	$2.00	$0.80
2. Borrow excav. uncl.	2,000 c. y.	.38	.75	.70
3. Overhaul	180,000 st. y.	.004	.003	.015
4. Road reconditioning	13.248 mi.	410.00	300.00	300.00
5. Watering	900 M.g.	2.10	4.00	2.25
6. Water plant (lump sum)		950.00	2,700.00	300.00
7. Apply prime asphalt, MC-2	365 ton	10.00	13.00	18.00
8. Apply asphalt, RC-4, cl. A. pav't	250 ton	10.50	17.00	20.00
9. Cover cl. A pav't. split method.	2,800 c. y.	4.00	6.10	6.40
10. Misc. clearing (force acct.)		1,500.00	1,500.00	1,500.00

SEWAGE PLANT, BUFFALO

OWNER: Buffalo Sewer Authority; Greeley & Hansen, Engineers.

PROJECT: Construction of sludge disposal building, sludge digestion tanks, brick stack, and electrical and boiler plant equipment in connection therewith for the Buffalo Sewer Authority for which bids were opened June 22, 1937.

LOW BIDDERS:

I. Sludge Disposal Bldg.	
1. F. H. McGraw & Co., Inc., New York, N. Y.	$321,920
2. Engstrom Wynn, Inc., Wheeling, W. Va.	337,680
3. F. A. Canuso & Son, Philadelphia, Pa.	341,711
II. Sludge Digestion Tanks.	
1. Lombardo Bros. Const. Co., Cleveland, O.	455,739
2. Constructors & Engineers, Inc., Chicago, Ill.	458,451
3. F. H. McGraw & Co., Inc., New York, N. Y.	481,245
III. Brick Stack (Lump Sum)	
1. Roy C. Siegel, Buffalo, N. Y.	28,783
2. A. Custodis Chimney Const. Co., New York, N. Y.	40,893
IV. Boiler Plant Equipment (Lump Sum)	
1. E. J. Leary, Buffalo, N. Y.	68,964
2. Ralph J. Moran, Buffalo, N. Y.	72,300
3. John W. Danforth Co., Buffalo, N. Y.	72,789
V. Electrical Work—Sludge Disposal.	
1. McCarthy Bros. & Ford, Buffalo, N. Y.	36,980
2. Sterns Elec. Co., Buffalo, N. Y.	38,258
3. Wipperman & Mitchell, Inc., Buffalo, N. Y.	38,643

I—SLUDGE DISPOSAL BUILDING

Item	Quan.	Unit Prices (Principal Items Only)		
1. Earth excavation	11,500 c. y.	$2.90	$3.80	$3.45
2. Rock excavation	50 c. y.	6.00	5.00	3.00
3. Selected fill	1,000 c. y.	1.50	1.80	1.50
4. Earth embankment	2,500 c. y.	.70	.60	.50
5. Earth excav. additional	2,000 c. y.	3.50	4.00	2.00
6. Remove pier	L. S.	4,000.00	500.00	3,000.00
7. Wood sheeting	70 M.b.m.	60.00	25.00	20.00
8. Steel sheeting	50,000 lb.	.03	.015	.02
9. Wood sheet piles	20 M.b.m.	60.00	75.00	90.00
10. Steel sheet piles	25,000 lb.	.04	.05	.045
11. Timber piles	500 l. f.	1.00	1.00	.65
12. Steel H piles	6,500 l. f.	1.50	2.00	1.50
13. Pile caps	10 M.b.m.	80.00	120.00	100.00
14. Wood foundations	20 M.b.m.	80.00	80.00	100.00
15. Pile load tests	5 each	300.00	500.00	300.00
16. Earth load tests	5 each	200.00	60.00	300.00
17. Reinforcing steel	425,000 lb.	.05	.05	.043
18. Reinforcing mesh	5,000 lb.	.08	.07	.06
19. Concrete, cl. A1, slabs, beams	1,250 c. y.	20.00	23.00	24.76
20. Concrete, cl. 2, floors, ftgs.	1,550 c. y.	13.00	12.00	15.00
21. Concrete, cl. B	750 c. y.	11.00	10.00	11.00
22. Precast concrete	10 c. y.	40.00	40.00	40.00
23. Rubbed finish	23,000 s. f.	.10	.10	.10
24. Copper expansion joints	200 l. f.	1.00	2.00	.80
25. Mastic expansion joints	100 s. f.	.50	.35	.20
26. Painted asphalt joints	100 s. y.	.40	.30	.50
27. Misc. common brick masonry	25 c. y.	40.00	25.00	30.00
28. Underdrains	100 l. f.	1.00	.40	1.00
29. C. I. pipe, b & s, 12 ft	30,000 lb.	.05	.06	.058
30. C. I. pipe, b & s, 3–12 ft	10,000 lb.	.06	.09	.093
31. C. I. pipe, b & s specials	11,000 lb.	.08	.14	1.25
32. C. I. pipe, flanged, 12 ft	8,000 lb.	.06	.07	.066
33. C. I. pipe, flanged, 3-12 ft.	11,000 lb.	.08	.12	.09
34. C. I. pipe, flanged special	24,000 lb.	.12	.17	.13
35. Valves, 4 in. plus	L. S.	3,000.00	3,100.00	2,700.00
36. Floor stands	L. S.	500.00	325.00	250.00
37. Structural steel	425,000 lb.	.052	.065	.0575
38. Misc. steel iron	10,000 lb.	.15	.15	.15
39. Iron castings	3,000 lb.	.12	.10	.15
40. Pipe supports	L. S.	2,100.00	1,000.00	1,000.00
41. Bronze, brass, copper	500 lb.	1.20	1.00	.75
42. Aluminum	500 lb.	1.70	1.00	1.25
43. Galvan. floor grating	3,500 s. f.	1.80	1.70	2.25
44. Pipe railing	1,000 l. f.	2.00	1.70	2.50

II—SLUDGE DIGESTION TANKS

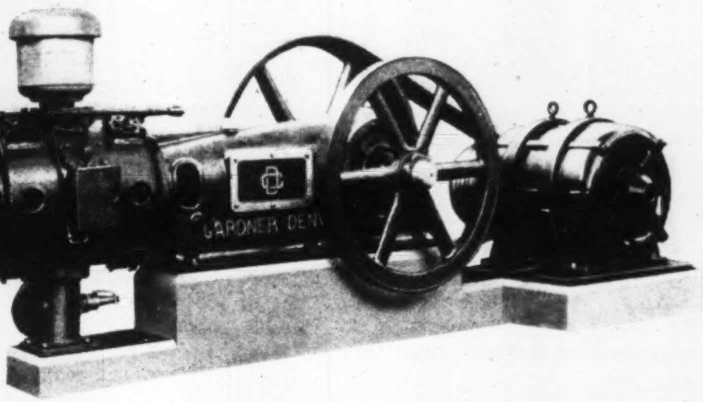
Item	Quan.	Unit Prices (Principal Items Only)		
1. Earth excavation	24,000 c. y.	$2.30	$2.25	$2.30
2. Rock excavation	50 c. y.	5.00	5.00	6.00
3. Selected fill	2,000 c. y.	1.00	2.00	1.50
4. Earth embankment	3,000 c. y.	.50	.50	.60
5. Earth excav. additional	2,500 c. y.	1.00	2.75	3.00
6. Remove pier	L. S.	2,000.00	4,000.00	4,500.00
7. Wood sheeting	20 M.b.m	40.00	35.00	40.00
8. Steel sheeting	25,000 lb.	.03	.03	.03
9. Wood sheet piles	20 M.b.m.	40.06	100.00	70.00
10. Steel sheet piles	450,000 lb.	.06	.045	.045
11. Timber piles	80,000 l. f.	.35	.55	.60
12. Steel H piles	300 l. f.	10.00	2.50	2.50
13. Pile capping	10 M.b.m.	100.00	90.00	80.00
14. Wood foundations	20 M.b.m.	80.00	90.00	80.00
15. Pile load tests	5 each	300.00	300.00	300.00
16. Earth load tests	5 each	200.00	275.00	200.00
17. Reinforcing steel	800,000 lb.	.05	.046	.05
18. Reinforcing mesh	5,000 lb.	.10	.07	.08
19. Concrete, cl. A1, slabs, beams	2,200 c. y.	25.00	23.00	23.00
20. Concrete, cl. A2, floors, ftgs	1,800 c. y.	16.00	14.00	15.00
21. Concrete, cl. B	300 c. y.	10.00	12.00	11.00
22. Precast concrete	10 c. y.	40.00	40.00	40.00
23. Rubbed finish	15,000 s. f.	.10	.12	.10
24. Copper expansion joints	100 l. f.	1.00	1.20	1.00
25. Mastic expansion joints	250 s. f.	1.00	.50	.50
26. Painted asphalt joints	650 s. y.	.65	.30	.40
27. Poured asphalt joints	1,350 gal.	.40	1.60	1.00
28. Misc. common brick masonry	60 c. y.	25.00	35.00	40.00
29. Underdrains	100 l. f.	1.00	1.00	1.00
30. C. I. pipe, b & s, 12 ft	60,000 lb.	.05	.0493	.05
31. C. I. pipe, b & s, 3–12 ft	33,000 lb.	.07	.0726	.055
32. C. I. pipe, b & s, specials	21,000 lb.	.09	.0883	.08
33. C. I. pipe, flanged, 12 ft	7,000 lb.	.06	.067	.065
34. C. I. pipe, flanged, 3–12 ft.	60,000 lb.	.10	.0882	.075
35. C. I. pipe, flanged specials.	60,000 lb.	.12	.1164	.10
36. Structural steel	80,000 lb.	.08	.075	.07
37. Misc. iron, steel	3,000 lb.	.15	.15	.15
38. Iron castings	2,500 lb.	.15	.15	.12
39. Pipe supports	L. S.	4,000.00	3,000.00	3,700.00
40. Bronze, brass, copper	500 lb.	1.00	1.00	1.20
41. Aluminum	200 lb.	1.00	2.50	1.70
42. Galvan. floor grating	120 s. f.	2.50	2.50	2.00
43. Pipe railing	20 l. f.	4.00	2.50	4.00

V—ELECTRICAL WORK, SLUDGE DISPOSAL

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Power equipment	L. S.	$29,340.00	$30,200.00	$30,796.00
2. Indoor fixtures	125 each	27.00	28.00	26.25
3. Entrance fixtures	6 each	80.00	78.00	77.50
4. Steel conduit, 3/4 in	5,000 l. f.	.32	.25	.265
5. Steel conduit, 1 in	1,000 l. f.	.31	.35	.34
6. Steel conduit, 1 1/4 in	500 l. f.	.41	.45	.465
7. Steel conduit, 1 1/2 in	500 l. f.	.51	.48	.495
8. Cable, No. 12, R. I. single, AWG	15,000 l. f.	.036	.04	.038
9. Do. No. 10, AWG	500 l. f.	.056	.06	.055
10. Do. No. 8, AWG	500 l. f.	.07	.08	.09
11. Lighting outlet boxes	131 each	1.90	2.00	1.95
12. S. P. wall switch, dust covers	40 each	6.00	6.50	5.90
13. S. P. wall switch, std. covers	10 each	4.10	4.00	3.85
14. Switch, 3 way, std. cover	10 each	4.50	4.50	4.28
15. Switch, 3 way, dust cover	20 each	6.40	7.50	5.68
16. Receptacle, 2 pole, 115 V, d. t.	40 each	6.00	7.00	5.63
17. Receptacle, 3 pole, 220 V, d. t.	5 each	10.00	8.50	11.25
18. Receptacle, 2 pole, 115 V, std	25 each	3.60	4.00	4.25
19. Receptacle, 3 pole, 220 V, std	25 each	7.20	7.00	9.55

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Improved Horizontal Compressor

An improved single-stage horizontal air compressor for heavy duty full load service and continuous operation has been announced by the Gardner-Denver Co. Electro-pneumatic control is an important feature of the "RX" compressor. With this control the compressor always starts unloaded and the air supply is automatically adjusted to fit the air requirements. Another feature is dustproof construction, which helps to increase the machine's life.

• • •

New Rubber Lubricant

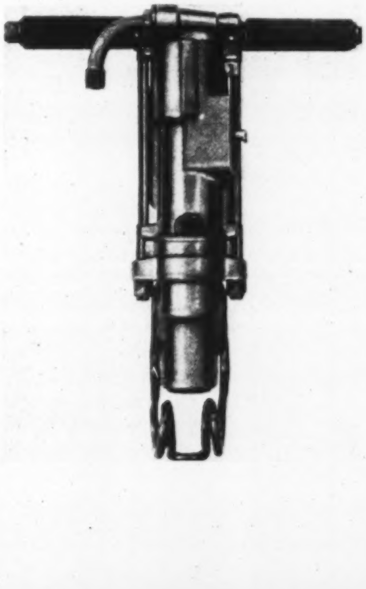
Rubber lubrication is accomplished by use of a composition recently developed by George F. Willson of Cleveland, Ohio, sales representative of the Acheson Colloids Corp. Colloidal graphite is an important constituent of the composition. The patent has been assigned to the Acheson Colloids Corp., Port Huron, Mich.

With the increasing use of rubber parts in machines, the problem of lubricating rubber has been troublesome because of the softening action on rubber of the usual lubricating agents, such as lubricating oil. It has been found that effective lubrication of rubber mechanical elements may be obtained by the use of this new composition.

• • •

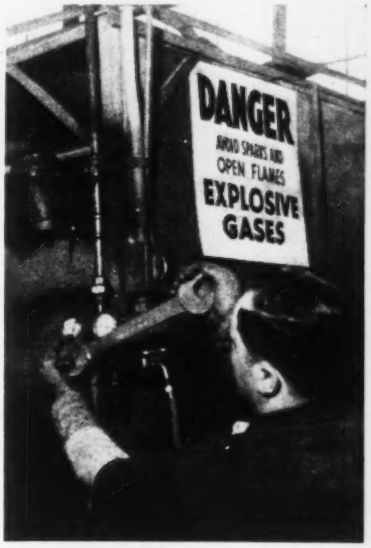
Medium Weight Drill

Sullivan Machinery Co., Claremont, N. H., has developed a 64 lb. rock drill which they claim to be the only machine of the intermediate weight on the market at the present time. The 64 lb. drill was developed by Sullivan engineers to give the contractor an easy handling medium weight machine with extra drilling power and rotational strength for deep hole work in hard rock. It gets its power from a positive compression thrown axial type valve coupled with $2\frac{7}{8}$ in. bore and long stroke piston. Besides handling standard sizes of collared steel, this machine has special constructions which can be provided to handle round lugged steel or shankless steels, of striking block construction. Also, a vented front end construction can be provided to qualify with laws on dust control.



Safety Wrenches

A line of "non-sparking" safety wrenches, drop forged from beryllium-copper, has been put on the market by J. H. Williams & Co., New York City. The tools are designed for use in the presence of inflammable gases and other locations where a spark caused by metal to metal contact would be dangerous. These wrenches are almost as strong as carbon steel tools of similar sizes, and they are also non-magnetic and non-corrosive.



MANUFACTURERS' ACTIVITIES

New Personnel

J. P. Boore, for several years vice president of Summerill Tubing Co., is now assistant general sales manager for the Babcock & Wilcox Tube Co., Beaver Falls, Pa.

Fabricated Plate division of the Emsco Derrick & Equipment Co., 6701-7101 South Alameda St., Los Angeles, has appointed Charles A. Flannery sales manager.

L. T. McGuire, for 18 years with the Byers Machinery Co., Ravenna, Ohio, as assistant sales manager, has recently entered the employ of the Harnischfeger Corp., Milwaukee, as divisional manager of the large-excavator division.

George S. Whyte, formerly president of the Macwhyte Co., Kenosha, Wis., has been elected to the newly created office of chairman of the Board of Directors.

Jessel S. Whyte has been appointed president and general manager of the Macwhyte Co., Kenosha, Wis.

Roots-Connersville Blower Corp., Connersville, Ind., announces recent appointments of zone representatives, as follows: Carl B. Sunderland, Muncie, Ind., covering Indiana, Ohio, Michigan, Illinois, and Kentucky; J. J. Heinrikson, Kansas City, Mo., covering the western part of Missouri, Kansas, Nebraska and Iowa; Paul C. Rowe, Newark, N. J., northern New Jersey.

McClave-Brooks Co.'s New York district territory has as its new manager of sales S. C. Barr. Offices are at 92 Liberty St., New York City.

Hal B. Alston, for eight years eastern sales manager of the Pacific Lumber Co., has been named manager of the new eastern offices of the California Redwood Association, trade organization of the Redwood lumber industry, at 155 E. 44th St., New York.

Lee S. Palmer has joined the staff of S. G. Hayes Co., paving contractors, as sales engineer.

North American Cement Corp., 285 Madison Ave., New York, early this year made the following appointments: Roy S. Adkins, general sales manager; William C. Brownson, assistant general sales manager, cement division; Albert R. Couchman, assistant general sales manager, lime and other products division.

H. F. Boe has been appointed commercial manager of the Westinghouse Electric & Mfg. Co. He will be responsible for the sale of Westinghouse products in the eastern division and will direct the commercial activities of the apparatus divisions.

L. F. A. Mitchell has recently been appointed to head the construction-industry section for the Westinghouse Electric & Mfg. Co.

New distributors

Tennessee Mill & Mine Supply Co., Knoxville, Tenn., is now Knoxville distributor for General Refractories Co., Philadelphia.

Byers Machine Co., Ravenna, Ohio, has announced the Hillsman Equipment Co., as its new Chicago distributor.

Cutler-Hammer, Inc., Milwaukee, has recently opened a new branch office in Dallas. The Dallas address is 624 Santa Fe Building.

Paving Supply & Equipment Co., Washington, D. C., has been appointed by Ransome Concrete Machinery Co., Dunellen, N. J., as representative for their line of truck mixers and agitators in the District of Columbia.

C. B. Collins Supply Co., Pittsburgh, is now a dealer for the Paragon Revolute Corp. of Rochester, N. Y. They are also Pittsburgh distributors for the Ozalid Corp. of New York.

Plant expansion

A new two story fireproof office building, 132 ft. long and 44 ft. wide, is planned by the Haynes Stellite Co., Harrison and Lindsay Sts., Kokomo.

The former Franklin plant, recently taken over for taxes by the City of Syracuse, N. Y., has been bought at public auction by the Carrier Corp., Newark, N. J. It is expected that 80 per cent of the administrative and productive operations of the air conditioning company will be shifted to Syracuse within one year.

Ruberoid Co.'s St. Louis plant extension, which will increase the factory's output of asbestos building products by more than 50 per cent, has been completed. Additional warehousing and distributing facilities have also been provided at the St. Louis plant.

Equipment Corp. of America has completed an all-steel, fireproof warehouse and office building at its Pittsburgh plant.

NEW PUBLICATIONS

Dust control and road soil stabilization is the subject of a 15-page booklet issued by the Columbia Alkali Corp., Barberton, Ohio.

Present-day information on the health hazards connected with welding operations has been compiled by the Industrial Health Section of the Metropolitan Life Insurance Co. in the form of a report entitled "Health Protection of Welders." Copies of this booklet are available from the Industrial Health Section, Metropolitan Life Insurance Co., New York.

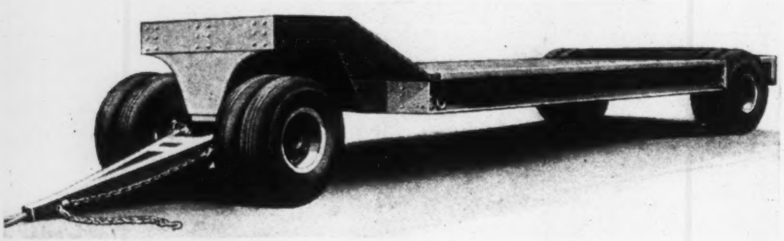
Griffin Wellpoint Corp., New York, has issued a 20-page booklet containing photographs of Griffin Wellpoint installations and drawings of suggested layouts for the use of Griffin jet-end drive wellpoints.

Specifications and designs for uses of Kentucky rock asphalt in construction and maintenance are given in a 30-page booklet issued by the Kentucky Rock Asphalt Institute, Louisville.

"Portrait of a Rust-Proofed Home" is the title of a 15-page booklet published by the American Brass Co., Waterbury, Conn. It is illustrated with suggestions for the home builder which show him ways in which he can avoid corrosion from moisture.

Neoprene, an engineering material with rubber-like properties, yet one which resists the deteriorating effect of oil, heat, sunlight, chemicals and oxidation, is described in a new handbook published by Rubber Chemicals Division, E. I. duPont de Nemours & Co.

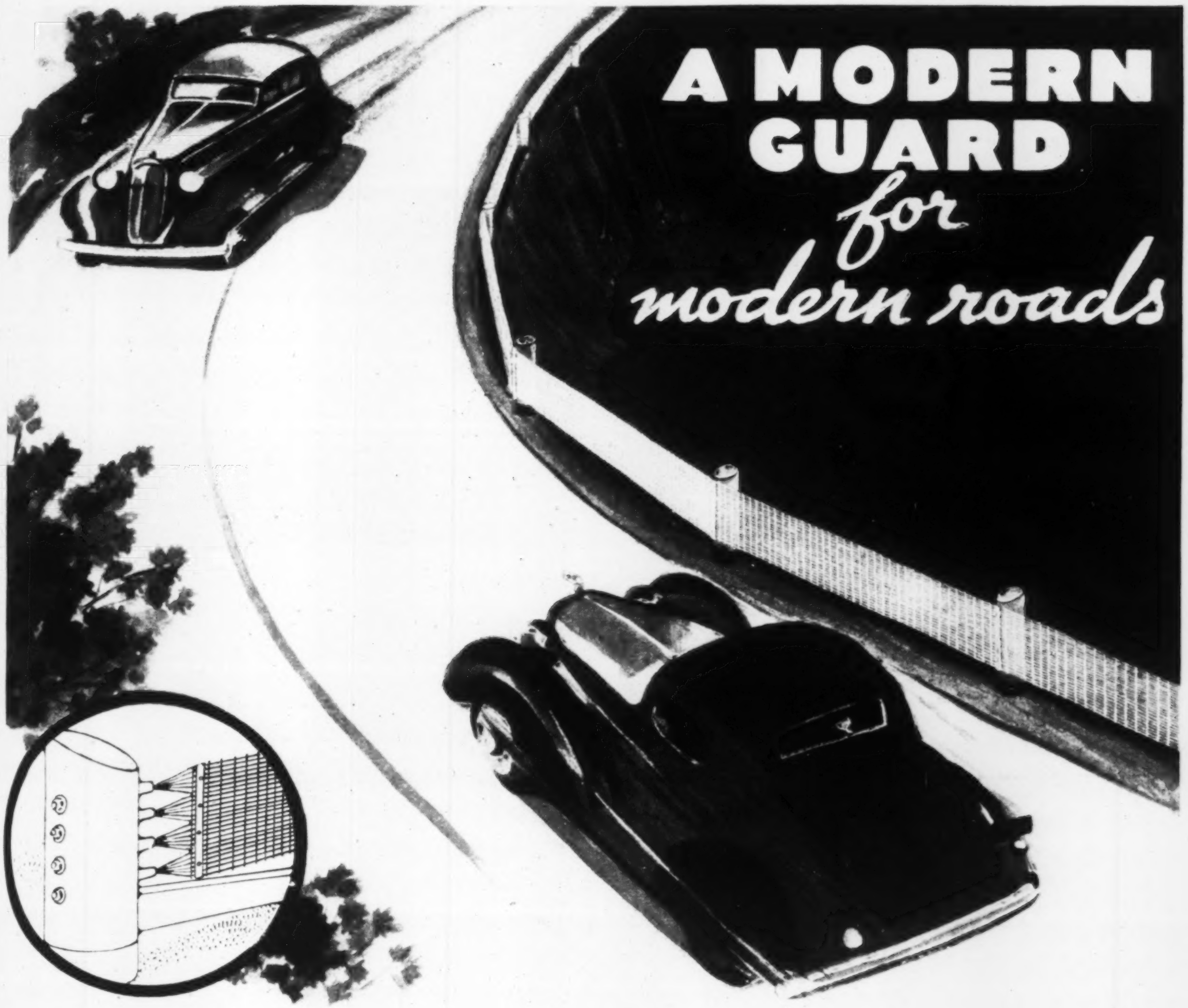
Mueller Co., Chattanooga, Tenn., has just published a 48-page catalog, A-300, covering the Mueller-Columbian line of sluice gates, control stands and valves.



Heavy Hauling Trailer

A new line of heavy-hauling machinery-trailers has been announced by the C. R. Jahn Co., Chicago. The Jahn Co. claims for these pneumatic-tired, heavy duty trailers greater strength, flexibility and ruggedness.

Capacities from 5 to 50 tons are available in either full or semi-trailers. Three different frames are offered—drop, light kickup, or flat platform, and practically all state regulations are conformed with by the overall widths, lengths, and wheel designs of the entire line. Strength and rigidity in the frame are said to be accomplished by using deeper main beam sections and a greater number of cross members. The small diameter of the wheels keeps the trailer bed low for easier loading handling.



Pittsburgh Safety Highway Guard meets the demands of modern traffic conditions by providing more than barrier protection. The spring-like action of its wide band of tightly woven, high tensile strength steel wires snubs shocks and shunts off vehicles that strike the guard, thus saving both vehicle and guard from serious damage.

Because of its ready adaptability to any grade, curve, dip or other road condition, "Pittsburgh" Guard is easily and economically installed. Fewer posts are required with this guard than with other types and accurate spacing is not necessary. At night the gleaming 14-inch band of white enameled wire outlines the roadway at danger points, making travel safer for all who use the "Pittsburgh" Guard protected road.

Complete technical data and cost information are available upon request. Send in the coupon below.

PITTSBURGH STEEL COMPANY, Pittsburgh, Pa.
New York • Cleveland • Detroit • Chicago • Memphis
Philadelphia • Charlotte • Tulsa • Houston • Los Angeles

Pittsburgh
Safety
HIGHWAY GUARD

PITTSBURGH STEEL COMPANY
1641 Grant Building, Pittsburgh, Penna.

Gentlemen: Please send me a summary of the Pittsburgh Testing Laboratory's report on Pittsburgh Safety Highway Guard.

Name ....

Title ....

Address ....

(Contract Unit Prices continued from page 204)

LACKAWACK DAM CAISSONS

OWNER: New York Board of Water Supply; Walter E. Spear, Chief Engineer.

PROJECT: Excavation of cut off trench and sinking of two exploratory caissons for the Lackawack dam in town of Wawarsing, Ulster Co. New York, forming part of the Delaware River aqueduct.

BIDS: Seven bids were opened June 2, 1937, ranging from a low of $737,777 to a high of $1,248,945.

LOW BIDDERS:

1. Triest Const. Co. New York, N. Y.	$737,777
2. The Two Companies Inc. Framingham, Mass.	779,805
3. Frederick Snare Corp., New York, N. Y.	783,260

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Remove buildings	L. S.	$12,733.00	$12,000.00	$10,000.00
2. Test borings	7,500 l. f.	5.00	4.30	4.00
3. Well drillings	1,000 l. f.	18.00	11.50	20.00
4. Excav. earth, open cut	55,000 c. y.	1.00	1.00	1.50
5. Exc. caissons, to El. 600	3,000 c. y.	28.00	20.00	10.00
6 Exc. caissons, El. 600 to 540.	2,500 c. y.	28.00	35.00	13.00
7. Exc. caissons, below El. 540.	1,600 c. y.	28.00	55.00	49.70
8. Exc. rock, open cut	4,500 c. y.	1.00	2.75	3.00
9. Exc. rock, comp. air	250 c. y.	28.00	35.00	90.00
10. Timber	45 M.b.m.	32.00	135.00	135.00
11. Embanking	25,000 c. y.	.29	.15	.70
12. Masonry conc., free air	7,000 c. y.	10.00	17.00	15.00
13. Masonry conc., comp. air	700 c. y.	25.95	18.00	30.00
14. Bitum. cure, conc.	8,000 s. y.	.32	.20	.50
15. Pump. equip caissons, capacity	10,000 g.p.m	3.25	1.70	2.72
16. Pump. equip., deep wells, capacity	5,000 g.p.m.	5.20	4.00	4.50
17. Pumping	200,000 mil.gal.ft.	.08	.15	.15
18. Drill holes, rock	500 l. f.	1.00	5.75	11.00
19. Mix. place grout	200 c. y.	1.62	19.00	9.00
20. Portland cement	17,000 bbl.	3.67	2.70	2.26
21. Crushed stone, gravel	600 c. y	1.62	7.50	7.00
22. Sand, filters, grout	300 c. y.	2.18	4.30	3.00
23. Struct. steel	50,000 lb.	.15	.10	.08
24. Steel, reinf. conc	600,000 lb.	.065	.07	.06
25. Misc. metal work	200,000 lb.	.21	.15	.25
26. Steel pipes, fitting	400,000 lb.	.08	.05	.10
27. C. I. pipes, fitting	12,000 lb.	00.05	00.14	00.08
28. Furnish, place well points	500 l. f.	15.17	12.25	3.00
29. Rubble paving, mortar	1,300 c. y.	4.50	15.00	15.00
30. Vitrified pipe	1,800 l. f.	2.78	.50	1.50
31. Chlorinators	2 ea.	5,000.00	3,900.00	5,000.00
32. Liquid chlorine	1,500 lb.	.16	.09	.15
33. Engineer's office	500 s. f.	4.82	9.80	12.00
34. Sanitary services	l. s.	19,000.00	11,000.00	8,229.00
35. Clean up	l. s.	800.00	2,000.00	5,530.50

CALIFORNIA STATE HIGHWAYS

OWNER: California State Highway Commission, Sacramento, Cal.; C. H. Purcell, engineer.

PROJECT: Construction of underdrains on 8 mi. highway in Madera Co.; road mix surfacing and asphalt seal coat on 16.1 mi. highway in Plumas Co.; and grading, crusher run base course, and road mix surfacing on 0.7 mi. in Shasta Co., Calif.

BIDS: Opened June 9, 1937; two only on the Madera project as tabulated below; six on the Plumas project ranging from a low of $37,004 to a high of $51,470; and five on the Shasta project ranging from a low of $23,119 to a high of $29,259. Minimum hourly wage rates are stipulated of $1.375 for skilled and 60c for common labor, with all material required for the construction to be furnished by the contractor.

LOW BIDDERS:

MADERA CO. UNDERDRAINS.

1. M. A. Curdy, Oakland, Cal.	$27,959
2. Bodenhammer Const. Co., Oakland, Cal.	29,469

PLUMAS CO. SURFACING.

1. Fredrickson & Westbrook, Lower Lake, Calif.	37,004
2. Geo. French, Jr., Stockton, Calif.	45,820
3. Harms Bros., Richfield, Calif.	46,466

SHASTA CO. SURFACING.

1. L. J. Immel, Berkeley, Calif.	23,119
2. Piazza & Huntley, San Jose, Calif.	23,183
3. J. P. Brennan, Redding, Calif.	23,673

MADERA CO. UNDERDRAINS

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Perf. metal pipe, 8 in	220 l. f.	$1.82	$1.30	....
2. Perf. metal pipe, 6 in	7,520 l. f.	1.39	.90	....
3. Perf. metal pipe, 4 in	1,120 l. f.	1.30	.75	....
4. Excavation, struct	2,700 c. y.	4.02	6.50	....
5. Rock fill	1,150 c. y.	4.17	3.50	....

PLUMAS CO. SURFACING

Item	Quan.	(1)	(2)	(3)
1. Mineral aggregate	8,200 c. y.	$2.57	$3.40	$3.25
2. Asphalt, ROMC-3, 4, surfacing.	470 ton	21.00	22.00	26.00
3. Asphalt, ROMC-3, 4, seal	156 ton	20.00	23.00	26.00
4. Sand seal coat	1,180 c. y.	2.50	3.40	3.00

SHASTA CO. SURFACING

Item	Quan.	(1)	(2)	(3)
1. Water	225 M.g.	$1.50	$2.00	$1.55
2. Remove concrete	115 c. y.	3.00	2.00	3.90
3. Road excav. uncl	8,900 c. y.	.35	.42	.45
4. Excav. struct	210 c. y.	1.50	1.00	1.75
5. Excav. ditch, channel	65 c. y.	1.00	1.00	1.00
6. Imported borrow	5,000 c. y.	.60	.47	.40
7. Overhaul	48,000 st. y.	.01	.01	.01
8. Finish roadway	36 sta.	7.00	5.50	7.00
9. Crusher run base	1,400 c. y.	2.85	2.90	2.70
10. Asphalt, ROMC-3, 4, prime	7 ton	25.00	24.00	27.50
11. Asphalt binder	1,650 s. y.	.03	.04	.06
12. Mineral aggregate, surface	650 c. y.	3.00	3.45	2.90
13. Asphalt, ROMC-3, 4, surface.	47 ton	25.00	24.00	27.50
14. Asphalt, ROMC-3, 4, seal	7 ton	25.00	24.00	28.00
15. Sand seal coat	50 c. y.	3.00	3.50	3.50
16. Reinforcing steel	26,000 lb.	.07	.07	.06
17. Conc. Cl. A, struct	180 c. y.	20.00	19.00	21.50
18. C. M. pipe, 12 in	24 l. f.	2.00	1.50	1.75
19. Salvage pipe culverts	30 l. f.	1.00	.35	.50
20. Laminated guard rail	1,000 l. f.	1.00	1.50	1.00
21. Remove guard rail	835 l. f.	.30	.25	.75
22. Culvert markers	2 ea.	3.00	3.00	2.00
23. Remove bridge	1 ea.	750.00	450.00	400.00
24. Monuments	10 ea.	4.00	3.00	2.80

CONCRETE FLUME, CALIFORNIA

OWNER: City & County of San Francisco, Calif.; N. A. Eckart, engineer.

PROJECT: Demolition of 2,900 ft. wood flume of the Stone Dam Aqueduct in San Mateo Co. Calif., and replacing it with 48 in. monolithic concrete pipe, to connect at its downstream end with a 44 in. steel-pipe inverted siphon and to an existing tunnel at its upstream end.

BIDS: Seven bids were received and contract awarded in June 1937 for the installation of monolithic concrete pipe as compared with the centrifugally spun concrete pipe alternative which ran 9 per cent higher than the former on the basis of the low bid.

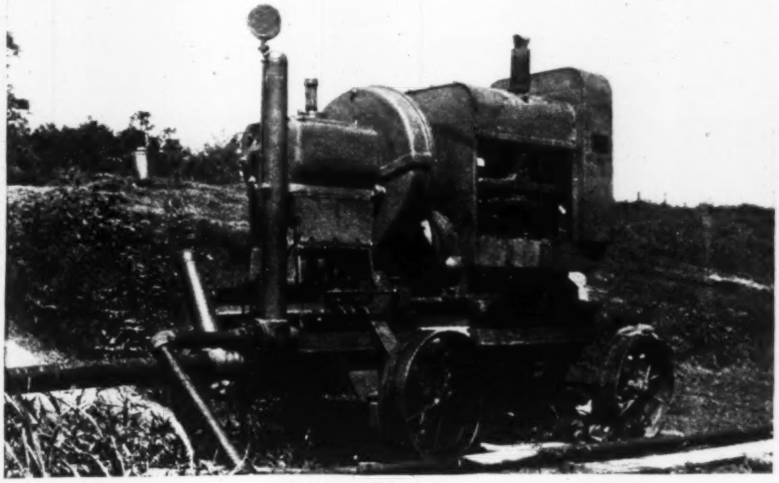
LOW BIDDERS:

1. Sibley Grading & Teaming Co. San Francisco, Calif. (contract) (centrifugally spun pipe alternative $37,774)	$34,710
2. Williams Bros. Haas, Inc. San Francisco, Calif. (centrifugally spun pipe alternative $47,686)	34,986
3. M. J. Lynch, San Francisco, Calif. (centrifugally spun pipe alternative $42,120)	44,617

Item	Quan.	Unit Prices (1)	(2)	(3)
MONOLITHIC CONCRETE PIPE ALTERNATIVE.				
1. Remove existing timber flume.	2,900 l. f.	$0.10	$0.172	$1.00
2. Trench excav. uncl	4,400 c. y.	.70	1.32	.75
3. Excav. struct. uncl	200 c. y.	2.00	3.29	4.00
4. Concrete, struct	60 c. y.	26.50	37.50	30.00
5. Concrete, 48 in. monol. pipe	890 c. y.	26.50	21.38	34.00
6. Reinforcing steel	70,600 lb.	.07	.084	.07
7. Conc. pipe, 42 in., spillway	25 l. f.	15.00	10.50	11.00
8. Redwood timber	1.2 M.B.M.	100.00	135.00	100.00
9. Misc. metal work	950 lb.	.25	.356	.20
10. Gate valves, 4 in	unit	90.00	50.00	30.00
CENTRIFUGALLY SPUN CONCRETE PIPE ALTERNATIVE				
4a. Concrete, structural	58 c. y.	26.50	37.50	30.00
5a. Concrete pipe, centrif. spun	2,900 l. f.	10.90	12.73	11.25
6a. Reinforcing steel	6,000 lb.	.07	.10	.07
7a. Conc. pipe, 42 in., spillway	25 l. f.	9.77	15.00	11.00
9a. Misc. metal work	1,050 lb.	.25	.35	.20

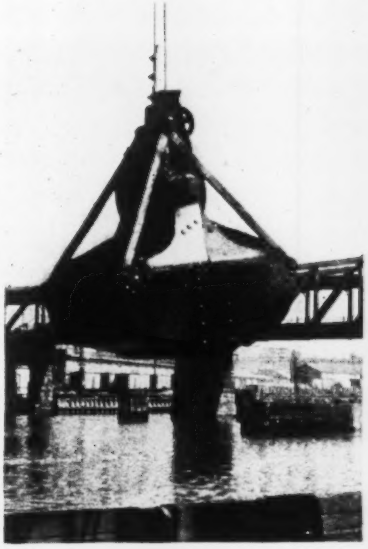
NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Paving Supply Pump

Gorman-Rupp Co., Mansfield, Ohio, has developed a triplex road pump capable of delivering 125 gal. per min. at 500 lb. pressure. It provides ample water supply for two 27E pavers and for properly wetting subgrades.

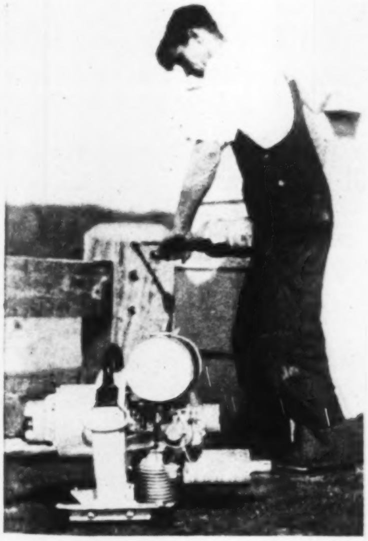


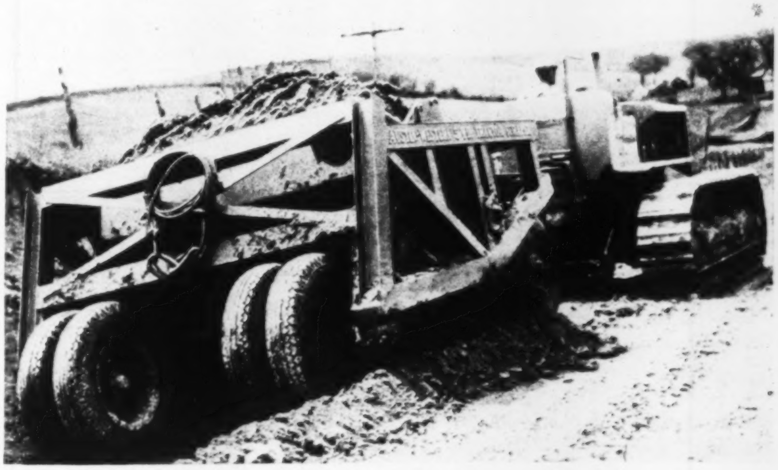
Alloy Used in Clamshell

Light weight alloy construction is offered in a new model clamshell bucket recently issued by the Hayward Co., New York, and shown in the accompanying illustration. The use of light metal gives it a ratio of approximately a pound of bucket to a pound of material carried.

Drill Uses A.C. or D.C.

In the accompanying photograph a Black & Decker $\frac{3}{4}$-in. heavy duty drill is being operated from a portable gasoline driven electric generator. The drill pictured is equipped with a universal motor, so built as to operate on either alternating or direct current, and may be used either with a portable current supply as shown or with an electric current supply obtained from a regular central station.





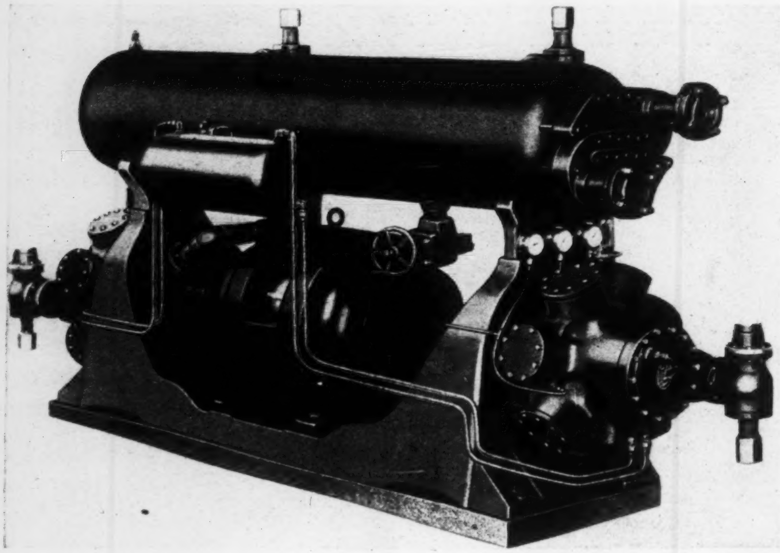
Austin-Western Scraper

Austin-Western Road Machinery Co., Aurora, Ill., has placed a new 5-yd. scraper on the market, which they claim loads with great ease and speed. Like its predecessor, the new scraper uses but one cable and one lever to control all loading, carrying and dumping, and is designed to work with any tractor within the horsepower range of 35 to 60. Adjustments have been provided which permit varying the clearance under machine.

• • •

Inspector's Lantern

National Carbide NJ-1 is a car inspector's lantern recently placed on the market by National Carbide Corp., New York. This lantern is provided with insulated handle, positive water feed control, patented rear light, and capacity for 8 hours burning time. It has a safety flame protector, porcelain burner tips, heat resisting glass lens and scientifically prepared hyblum reflector which spreads the light evenly over the whole area.



Radial Air Compressor

A line of high speed radial compressors designed principally for use in the air conditioning field, was recently announced by Airtemp, Inc., air conditioning subsidiary of Chrysler Corp. The dual 7 cylinder radial compressor is shown in the accompanying illustration. Models range from 2 to 7 cylinders and there are two cylinder sizes. Its designers claim balance and lack of vibration result from use of the radial design, and also that much space is saved, a feature that often needs consideration in air conditioning installations.

MANUFACTURERS' ACTIVITIES

Central Foundry Co. is now located at 386 Fourth Ave., New York.

Clark Bros. Co., Olean, N. Y., builders of two cycle gas engines and compressors, and S. R. Dresser Mfg. Co., Bradford, Pa., manufacturers of flexible pipe joints, merged recently.

A million-dollar blast furnace being erected by the Hamilton Coke & Iron Co., near Hamilton, Ohio, will be ready for operation early in August. Work on the furnace was started in December, 1936.

Pangborn Corp., of Hagerstown, Md., manufacturers of blast cleaning and dust collecting equipment, are spending approximately $80,000 for building construction and new equipment.

Bay City Shovels, Inc., Bay City, Mich., has built a new factory building, 200 ft. long by 85 ft. wide, in order to meet demands for convertible power shovels, cranes, draglines, trailers and dragline buckets. Other new equipment includes a quantity of machines, tools and a new overhead traveling crane.

A Reinforcing Bar fabricating shop and warehouse to serve the metropolitan area of New York has been opened by Bethlehem Steel Co. It is located at Front and Marshall Sts., Elizabeth, N. J.

Gasoline Hammers

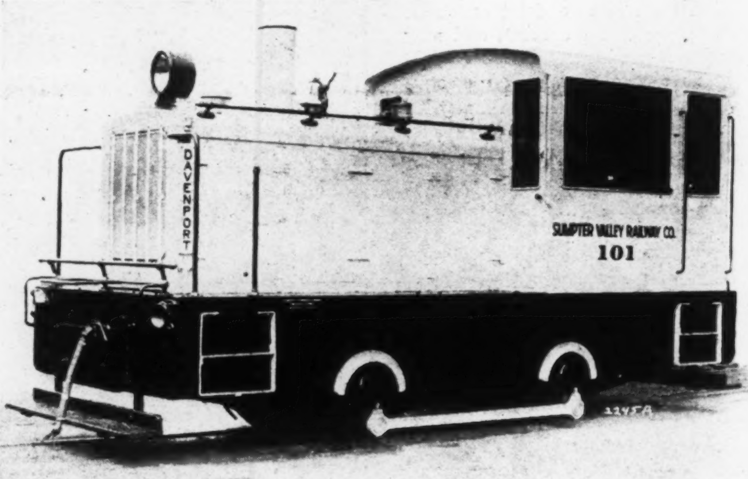
Two new gasoline portable hammers have been developed by the Barco Mfg. Co., of Chicago. One, model H-6 heavy duty type, weighs 89 lb., and the other, Model J-2, weighs 70 lb. The changes incorporated consist of a new timing device and rearrangement of the lower end. The tie rod springs have been eliminated and in place of them an internal cushion spring is used. When lifting the hammer for a new location, the spring takes the shock of the blow.

• • •

Engine Control

Automatic control for industrial power units is the latest addition to the Waukesha engine line. It eliminates the usual manual operations required for starting, stopping, controlling the speed, or applying the load. The clutch is automatic so that it disengages if an overload pulls down the engine speed, and re-engages after the speed picks up.

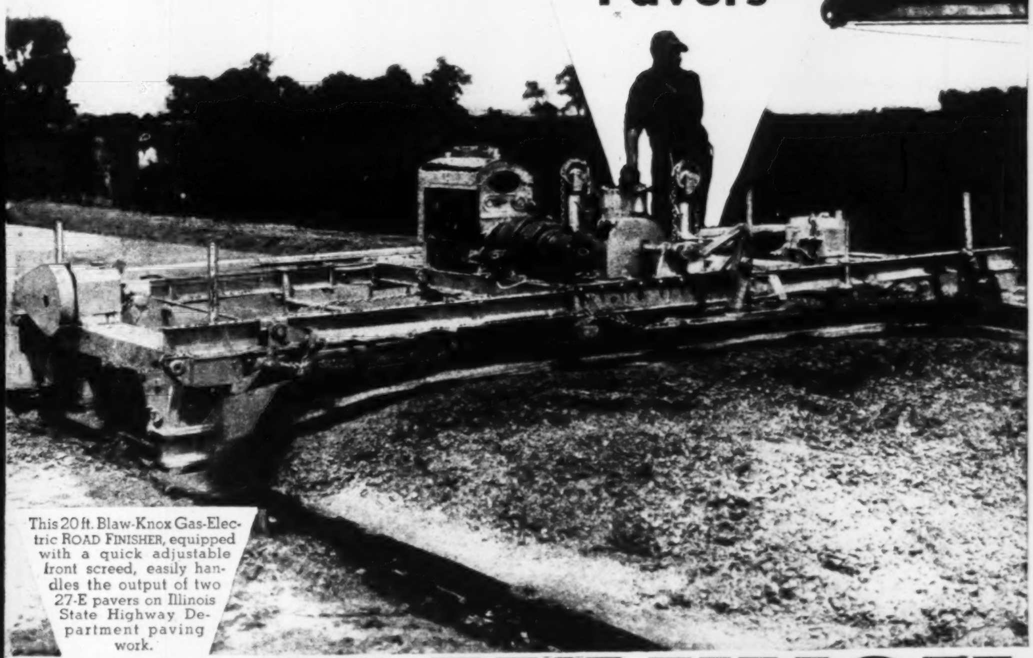
Added to the conventional 4- or 6-cylinder gas engine set-up are: a clutch and power take-off operated by vacuum; an electric control assembly containing a master switch, three safety switches to stop the engine in case the oil or water supply should fail or to limit the length of cranking operation in case the fuel fails, and a time-cycle switch that starts and stops the unit at pre-selected intervals.



Diesel Locomotive

Diesel mechanical locomotive weighing 30 tons is the first of a new style developed by the Davenport Besler Corp. and is of a size which they believe should prove interesting to contractors. The unit, powered with a Caterpillar G-1700 diesel engine, is said to gain unusually positive power on the driver because of the use of side rods. The locomotive incorporates an axle-hung transmission which is stated to be very similar to the electric motor.

This FINISHER is Stepping Right Along Behind Two Pavers



This 20 ft. Blaw-Knox Gas-Electric ROAD FINISHER, equipped with a quick adjustable front screed, easily handles the output of two 27-E pavers on Illinois State Highway Department paving work.

It's a BLAW-KNOX GAS-ELECTRIC

● INVESTIGATE—know the fine performance of the Blaw-Knox Gas-Electric Road Finisher for concrete and bituminous paving. Widespread use throughout the country is definite proof of the practical efficiency of the Blaw-Knox gas-electric principle.

Some of the advantages of the Blaw-Knox Gas-Electric Road Finisher are:

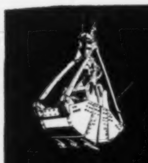
Rapid and easy adjustment of width.
More positive and smoother power and traction.
Greater accuracy of steering on the forms.
Easier on the road forms.
Faster; greater flexibility of speeds.
Removable flanges on traction wheels, for quick wheel changes.
Vibrator for joints can be be plugged in on the finisher, eliminating the need of a separate generator.
Smoother and truer finish of slab.

These and many other points of performance and convenience have been demonstrated conclusively in the field under a great variety of paving conditions.

If you wish further details of the Blaw-Knox Gas-Electric Road Finisher, send for Blaw-Knox Catalog No. 1507.

BLAW-KNOX COMPANY . . . PITTSBURGH, PA.

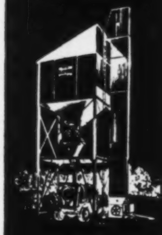
Offices and Representatives in Principal Cities



CLAMSHELL BUCKETS

TRUCK MIXERS

ROAD FORMS



BULK CEMENT PLANTS

BATCHERPLANTS

STEEL STREET FORMS

also: WEIGHING BATCHERS for Aggregates and Cement . . CENTRAL MIXING PLANTS . . TRUCK MIXER LOADING PLANTS . . STEEL FORMS for General Concrete Construction . . CONCRETE BUCKETS . . BOTTOMLESS SCRAPERS . . SHEEPSFOOT TAMPING ROLLERS

(Continued from page 244)

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS ¾-in. billet *b*	RIVETS ¼-in. structural	WIRE NAILS Base	SHEET PILING Base	STEEL RAILS Per Gross Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle bars	Std. spikes *c*	Tie plates *c*	Track bolts
Birmingham	$2.40	$2.60	$3.70	$2.55	....	$42.50	$43.00	$42.00	$2.80	$3.15	$2.30	$4.35
Chicago	2.30	2.60	3.70	2.80	$2.70	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Pittsburgh	2.25	2.55	3.60	2.75*d*	2.60	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Buffalo	2.35	2.60	....	....	....	....	....	....	....	....	2.30	
Cleveland	2.435‡	2.60	....	....	....	....	....	....	....	....	....	
Youngstown	....	2.60	....	....	....	....	....	....	....	3.15	....	
Gulf ports	2.65a	2.95a	....	....	3.05a	....	....	....	....	....	....	
Pacific ports	2.80a	2.95a	....	....	3.05a	....	....	....	....	3.15	2.40	

‡ Delivered. *a* F.o.b cars dock. REINFORCING BARS: *b* For rail steel deduct 15c. from billet prices. TRACK SUPPLIES: *c* Other basing points Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone. Steelton, Pa., on spikes alone. Leba Richmond, Va. WIRE NAILS: *d* Add switching charge $18 per c.l.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRIC

	STRUCTURAL SHAPES Per 100 lb., base price	REINFORCING BARS Per 100 lb., ¾ in., base price 15 tons or over *b* New billet	Rail steel	Add $ cwt. for Switch	Del.	EXPANDED METAL LATH Per 100 sq.yd., carload lots Std. diamond mesh, 3.4 lb	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 s.f., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires Per sq. yd.	SHEET PILING Per 100 lb base price
Atlanta	$3.65	$2.82	$2.67	.02½	.10	$21.00	$23.00	$1.75	$1.31	$0.1692	$2.60
Baltimore	3.60	2.82	2.67	....	.10	21.00	23.00	1.62	1.22	.1566	2.95
Birmingham	2.40*a*	2.60	2.45	.02½	.10	22.50	24.50	....	....	.....	
Boston	4.07	3.03	2.88	$20 C.L.	.10	21.60‡	23.60‡	1.68	1.26	.1620	3.02
Chicago	2.30*a*	2.60	2.45	.03	.05	23.00	25.00	1.61	1.22	.1557	2.70
Cincinnati	3.95	2.815*c*	2.665*c*	....	.05	25.01	29.50	1.60	1.21	.1548	
Cleveland	3.86	2.60	2.45	.02½	.10	22.00	24.00	1.59	1.20	.153	
Dallas	2.45	3.335	3.185	....	....	.....	.....	1.86	1.38	.1791	2.85
Denver	4.48	4.00	3.85	....	....	23.50	25.50	1.87	1.38	.1809	
Detroit	3.95‡	2.70	2.55	....	.10	22.50	24.50	1.62	1.22	.1566	[illegible]
Kansas City	4.24	3.02*c*	2.87*c*	.0	.05	20.50	22.50	1.82	1.29	.1665	3.12
Los Angeles	3.825	2.90	2.75	.02½	.05	23.00	27.50	1.89	1.40	.1827	[illegible]
Minneapolis	4.00‡	2.90*c*	2.75*c*	.0	.10	26.00	30.00	1.71	1.28	.1656	3.00
Montreal	2.90	2.40	2.40	....	....	32.50	32.50	2.46	1.82	.253	3.50
New Orleans	....	2.94	2.79	.05	.10	21.00	23.00	1.76	1.31	.1701	
New York	3.97	2.88	2.73	....	.10	21.50	23.00	1.67	1.26	.1584	2.93
Philadelphia	3.90	2.84	2.69	....	....	22.50	24.50	1.63	1.23	.1575	2.89
Pittsburgh	2.25*a*	2.55	2.40	.02½	.10	20.00	22.00	1.55	1.18	.1494	2.60
St. Louis	3.99	2.87	2.72	.0	.05	22.00	26.00	1.62	1.21	.1566	2.97
San Francisco	3.95	2.95	2.80	.02½	.10	24.50	26.50	1.89	1.39	.1827	3.15
Seattle	3.10	2.95	....	....	....	25.50	27.50	1.89	1.39	.1827	3.05

‡ Delivered. STRUCTURAL SHAPES: *a* Mill prices. REINFORCING BARS: *b* 5–15 tons, add 15c. 1–5 tons, add 25c. Less than 1 ton, add 50c *c* 20 tons or over Base. SHEET PILING: *d* Mill price plus freight.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in. *a*	VITRIFIED SEWER PIPE Per foot, 8 in., s.s.	delivered, 12 in., s.s.	ASTM 24 in., d.s.	C13–35 36 in., d.s.	CLAY DRAIN TILE Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTM C 14–35 12 in.	24 in.	WROUGHT STEEL PIPE Full standard weight. *h* 1 to 3 in., Butt Weld Black %	Galv. %	3½ to 6 in., Lap Weld Black %	Galv. %
Atlanta	$50.00	$0.26*bc*	$0.468*bc*	$1.69	$4.50*c*	$85.00	$128.00	$0.45	$1.625	44.5	35.5	42	32.0
Baltimore	53.50	.28	.54	2.38	7.18	110.00	170.00	.40	1.60	....	....	....	
Birmingham	46.00	.25	.45	1.625	4.66	85.00	220.00	.40	1.60	64.5	55.5	62	52.5
Boston	53.50	.224	.432	1.98	5.825	99.00	153.00	.45	2.50	....	....	....	
Chicago	54.50	.28	.54	2.25	6.25	100.00‡	150.00‡	.38	1.48	52.5	41.25	50.625	37.5
Cincinnati	53.00	.217	.4185	1.80	5.2275	75.00	120.00	.80	2.20	52.6875	41.4375	49.5625	37.6875
Cleveland	54.50	.196	.378	1.665	4.8175	69.00	108.00	.35	1.75	56	44.5	51.5	40.5
Dallas	58.00	.40	....	.....	....	160.00	260.00	.46	1.57	69.5	61.5	67	58.5
Denver	66.00	.29†	.50†	2.10†	....	130.00	220.00	....	....	44	33	41	29
Detroit	52.40	.203	.3915	1.71	5.2375	82.00	136.00	.30375	1.3725	53.2	41.9	50.1	37.8
Kansas City	56.00	.30	.54	2.16	5.00	120.00	240.00	.45	1.60	49	37.6	45.8	34
Los Angeles	54.50	.282†	.508†	2.034†	5.085†	115.50	192.50	1.00	2.00	57.1	48.1	54.6	44.6
Minneapolis	57.00	.24†	.432†	1.728†	4.60†	......	......	.65	1.75	....	....	....	
Montreal	55.00	.33†*e*	.59†*e*	2.04†*e*	....	82.00	134.00	.51	2.04	....	....	....	
New Orleans	52.00	.26	.468	1.69	....	......	......	.45	1.65	....	....	....	
New York	53.00	.28	.58	2.45	6.30	......	......	.55	2.00	52.49*i*	41.53*i*	48.20*i*	37.80
Philadelphia	50.00	.224	.45	2.25	6.00	150.00	180.00	.54	1.80	64.5*i*	55.5*i*	62*i*	52.5
Pittsburgh	56.00	.182†	.351†	1.62†	4.92†	97.80	154.20	.85*g*	2.00*g*	64.5*j*	55.5*j*	62*j*	52.5
St. Louis	53.00	.28	.504	2.016	3.96	85.00	170.00	.75	2.00	51.125	39.875	48.70	36.125
San Francisco	55.00	.315*d*	.567*d*	2.268	5.67	103.50	172.50	.45	2.50	53	44	42.75	33.33
Seattle	55.50	.294	.441*f*	2.142*f*	5.355*f*	68.00	160.00*	.60*	1.60	37	27	37	24

‡ Delivered. † F.o.b. * Less 30% in C/L lots. CAST IRON PIPE: *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. ($50.00. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. VITRIFIED PIPE: *b* Double *c* List to dealer. *d* List. *e* Sales and municipal taxes extra. *f* Less 30% in C/L Lots. CONCRETE PIPE: *g* Culvert pipe. WROUGHT STEEL PIPE: *h* from standard list for delivery from warehouse, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ⅛ in., 8½c.; ¾ in., 11 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92. *i* Resale price to consumer, car load lots shipped from mill. *j* Applies also at Lorain, O Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at WROUGHT IRON PIPE: Base price and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base: Buttweld — 1 in. and 1¼ in. black 14; 1½ in. black 34, galv. 16½; 2 in. black 33½, galv. 16. Lapweld — 2½ in. to 3½ in. black 27½, galv. 12½; 4½ in. to 8 in. black, 28½ galv. 15.

LUMBER, TIMBER, PLYWOOD—PER M FT. B.M., CARLOAD LOTS F.O.B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir planks No. 2 common; Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)

LONG LEAF Y. P.: Merchantable grade up to 20 ft

PLYWOOD: Rail freight increment (See note for base price)

	1x6, S4S	1x8, S4S	2x4, S4S	2x6, S4S	2x8, S4S	2x10, S4S	3x12, R/S	6x12, R/S	12x12, R/S	Long Leaf 2x12, R/S	Long Leaf 12x12, R/S	Plywood 5/8"	Plywood 3/4"
Atlanta	**$17.00**	**$17.00**	**$17.00**	**$17.00**	**$17.00**	**$20.00**	**$25.00**	.....	.....	$44.00	$48.00	$16.80	$20.50
Baltimore	**30.00**	**30.00**	**32.50**	**32.50**	**32.50**	**35.00**	**44.00**	.....	.....	66.00	66.00	16.45f	20.05f
	35.00	*35.00*	*36.00*	*34.00*	*34.00*	*35.00*	*38.00*	*$37.00*	*$36.00*	.....	.....		
Birmingham	**22.00**	**22.00**	**24.00**	**23.00**	**24.00**	**27.00**	**32.00**	**32.00**	**32.00**	.....	.....	15.55	18.95
1	26.00	26.00	30.00	29.00	30.00	35.00	54.00	.....	.....	48.00	53.00	.....	.....
Boston	33.00[2]	33.00[2]	38.00[3]	38.00[3]	53.00[1]	60.00[1]	75.00[1]	.....	.....	75.00	75.00	16.45f	20.05f
	32.00	*32.00*	*38.00*	*38.00*	*38.00*	*40.00*	*40.00*	*48.00*	*48.00*	.....	.....	.....	.....
Chicago	**28.00**	**29.00**	**30.00**	**29.00**	**30.00**	**31.00**	**43.00**	.....	.....	70.00	70.00	12.45	15.15
	35.00	*35.00*	*39.00*	*38.00*	*39.00*	*39.00*		*45.00*	*45.00*				
Cincinnati	**25.50**	**25.50**	**25.50**	**24.50**	**25.50**	**28.50**	**39.50**	.....	.....	41.00	44.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	.....			.....	.....	.....	.....
Cleveland	**35.00**	**37.00**	**42.00**	**35.00**	**43.00**	**45.00**	**52.00**	*46.00*	*48.00*	55.00	67.00[8]	15.55	18.95
Dallas e	**30.00**	**31.00**	**33.50**	**29.50**	**32.00**	**33.50**	**46.50**	**51.00**	**69.50**	62.50	87.50	13.15	16.05
Denver ‡	46.00[4]	46.00[4]	50.00[4]	49.00[4]	49.00[4]	55.00[4]	54.00[4]	64.00[4]	67.50[4]		.....	9.35	11.35
Detroit	**27.00**	**27.00**	**27.00**	**27.00**	**27.00**	**29.00**	**38.00**	.....	.....	32.00	44.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	*43.00*	*43.00*	*43.00*	.....	.....		
Kansas City	**26.00**	**26.00**	**28.00**	**27.00**	**28.00**	**29.00**	**40.00**	.....	.....	55.00	60.00	11.45	13.95
	30.00	*30.00*	*31.00*	*30.00*	*30.00*	*31.00*	*35.00*	*38.00*	*38.00*	.....	.....	.....	
Los Angeles a	*36.00*	*35.00*	*36.00*	*35.00*	*37.00*	*37.00*	*41.00*	*48.00*	*43.00*	.....	.....	8.90fg	10.80fg
Minneapolis ‡b	54.00[5]	54.00[8]	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.45	13.95
‡	*45.00*	*45.00*	*48.00*	*46.00*	*46.00*	*47.00*	*65.00*	*67.00*	*67.00*	47.00	.....	.....	.....
Montreal	*46.00*	*48.00*	*52.00*	*50.00*	*54.00*	*69.00*	*84.00*	.....	.....	.....	.....	.....	.....
	54.75	*54.75*	*49.25*	*60.75*	*60.75*	*64.25*	*47.00*	.....	.....	.....	.....	.....	.....
New Orleans	**33.00**	**36.00**	**42.00**	**34.00**	**40.00**	**39.00**	**50.00**	.....	.....	54.00	59.00	13.15	16.05
	28.90	*31.50*	*35.90*	*29.50*	*33.00*	*34.00*	*38.00*	.....	.....	.....	.....	.....	.....
New York ‡	**38.00**	**39.00**	**37.50**	**40.00**	**40.00**	**41.00**	**46.00**	.....	.....	80.00	82.50	16.45f	20.05f
‡	.....	.....	*47.50*	*47.50*	*47.50*	*47.50*	*47.50*	*52.50*	*52.50*	.....	.....	.....	.....
Philadelphia	**25.50**	**27.00**	**26.50**	**27.00**	**28.00**	**29.00**	**31.50**	.....	.....	70.00	70.00	16.45f	20.05f
	40.00	*40.00*	*38.25*	*39.00*	*40.00*	*40.00*	*40.00*	*46.50*	*46.50*	.....	.....	.....	.....
Pittsburgh	**38.10**	**39.90**	**47.05**	**42.00**	**45.65**	**46.90**	**59.70**	.....	.....	57.50	57.50	16.20	19.70
	51.90	*49.60*	*49.60*	*49.60*	*48.50*	*49.25*	*66.55*	*66.55*	*66.55*	.....	.....	.....	.....
St. Louis ‡c	**31.00**	**32.00**	**30.00**	**29.00**	**30.00**	**32.00**	**48.00**	*53.00*	*53.00*	72.00	71.00	13.15	16.05
San Francisco d	*26.50*	*22.00*	*27.60*	*22.50*	*26.50*	*22.50*	*29.00*	*22.00*	*22.00*	.....	.....	6.95f	8.50f
Seattle	*26.00*	*26.00*	*28.00*	*27.00*	*27.00*	*27.00*	*33.00*	*33.00*	*32.00*	.....	.....	0.00	0.00

LUMBER NOTES: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers' N.C. Pine. [3] Spruce. [4] Native. [5] Western Pine, No. 3 common. [7] Pine. [8] Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors in Minneapolis and St. Paul get 10% disc. from list. *c* 5M ft. or less. *d* At ship's side. *e* 10% discount taken off.

PLYWOOD: Note: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, car load lots, delivered per 1000 sq. ft. face. Base price — Seattle: 5/8", $72.25; 3/4", $82.45. For other centers add rail freight increment from table for proper size. Add: for form oil treatment, .50 per M. sq. ft.; for mineral paint sealed edges, $1.00 per M; for resin dipped treatment, $10.00 per M. *f* Lower rate by water shipment. *g* 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

WINDOW GLASS: Discounts from latest jobbers list, Sept. 15, 1928. Single or Double Thickness

EXPLOSIVES: Per lb. dynamite delivered 50-lb. cases. Gelatin

	Window Glass A quality	Window Glass B quality	Explosives 40%	Explosives 60%
Atlanta	85%	87%	$0.16	$0.175
Baltimore	88%	87%	.16	.18
Birmingham	88%	90%	.095	.11
Boston	87%	89%	.16f	.175f
Chicago	86%	87%	.115d	.13d
Cincinnati	89-10%	91-10%	.17g	.19g
Cleveland	85-10%	85-10%	.205h	.215h
Dallas	80%	80%	.16	.170
Denver	85%	86%	.16i	.175i
Detroit	87-10%	89-10%	.21	.24
Kansas City	86-10%	87-10%	.165	.18
Los Angeles	90%a	90@40%	.1725e	.1925e
Minneapolis	84-10%	85-10%	.175j	.19j
Montreal	60-30%	70-5%	.18†	.1975†
New Orleans	88%s 85%	86%s 80%d	.16	.185
New York	89%	90%	.23c	.245c
Philadelphia	88%	89%	.16	.175
Pittsburgh	86%	87%	.1525	.165
St. Louis	88%	88%	.155	.17
San Francisco	78%	83%	.1475	.1625
Seattle	83%	86%	.1675	.1825

GLASS: *a* Disc. from list Aug. 1, 1929. *s* Single thickness. *d* Double.

EXPLOSIVES: *c* Additional delivery charge in Queens, Richmond, Kings and South of Canal St., Manhattan, $6 per trip. *d* Carload lots 2½ c. higher in 1 ton lots, 4½ c. higher in less than ton lots. *e* F.o.b. Arsenal. *f* $4.00 delivery charge under 350 lb. *g* F.o.b. warehouse. *h* Delivered and picked up each day for storage at night. *i* F.o.b. Louviers, Colo. *j* 200 # or over. † F.o.b

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb	$2.00–2.85
Calcium chloride, 77–80%, flaked, in 400-lb. drums or 100-lb. moisture proof bags, f.o.b. works, freight equalized with points of competition, per ton	22.00–35.00
Chlorine cylinders, per lb. delivered	.055–.06
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	1.25

PILES, TIES—F.O.B.

PILES

Prices per linear foot, pine, with bark on, f.o.b. New York; delivered from barge 1½ to 2c. per ft. additional:

Dimensions	Points	Length	Short Leaf Barge	Short Leaf Rail
12 in. at butt	6 in.	30 to 50 ft.	$0.18	$0.195
12 in.—2 ft. from butt	6 in.	50 to 59 ft.	.225	.24
12 in.—2 ft. from butt	6 in.	60 to 69 ft.	.23	.255
14 in.—2 ft. from butt	6 in.	50 to 69 ft.	.24	.265
14 in.—2 ft. from butt	6 in.	70 to 79 ft.	.265	.275
14 in.—2 ft. from butt	5 in.	80 to 85 ft.	.38	.415
14 in.—2 ft. from butt	5 in.	85 to 89 ft.	.42	.482

RAILWAY TIES

Prices f.o.b., per tie, for carload lots:

		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 9' x 8' 6" Untr.	7" x 9' x 8' 6" Tr.
Boston	Oak	$1.20	....	$1.75	....
	Pine	1.25	$1.75a	1.90	$2.65a
New York	S.L. Sap Pine	1.00/1.10	1.60g	1.25	2.25g
	Mixed Oak	1.55	....	1.75	....
Birmingham	White Oak	.85	1.50a	1.35	1.70a
	Southern Pine	.55b	1.10ab	.70	1.30a
Chicago	Oak	....	1.67ac	....	2.05ac
	Oak	....	1.55d	....	1.90d
	Southern Pine	....	1.50a	....	1.95a
Los Angeles	Douglas Fir	.64	1.38a	.90	1.80a
Philadelphia	Red Oak	1.25	....	....	2.60a
St. Louis	White Oak	1.25	....	1.60	....
	Red Oak	1.20	1.60a	1.50	2.00a
	Sap Pine or Cypress	1.05	....	1.35	....
San Francisco	Douglas Fir	1.15bef	....	....	2.45caf
Montreal	Birch or Maple	.65	1.05	.75	1.35

TIES: Tr.— Treated; Untr.— Untreated. *a* Creosoted. *b* 6" x 8" x 8' 6" *c* Empty cell. *d* Zinc. *e* Green. *f* At ships tackle. *g* Dense pine

CHEMICALS, Continued

Soda ash, 58%, in paper bags, per 100 lb. dense	$1.23
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	27.00–30.00
Sulphate of copper, in bbl., per 100-lb	5.15–5.40

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M, lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M, lots of 2,000 pieces or over,			BRICK Per M, in quantity,		LIME		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Per ton, Hydrated finishing	in paper, Common hydrated	carload lots Pulverized or lump
Atlanta	$63.20	$67.40	$126.30	$126.30	$147.40	$168.40	$12.75	$15.15	$19.50	$14.00	$14.00
Baltimore	91.00	98.00	183.00	219.00	315.00	390.00	13.00	17.00	20.00	14.00	2[illegible].00
Birmingham	78.75	84.00	157.50	189.00	201.25	242.00	15.00	19.00	3.00o	1.75o	2.25
Boston	86.25ab	92.00ab	172.50ab	195.90ab	211.65ab	242.00a	16.00i	19.00i	20.00	15.50	[illegible].50
Chicago	66.00	70.50	132.00	174.30	214.40	245.00	11.00	12.00	16.00	14.00	12.8[illegible]
Cincinnati	56.45	60.40	115.25	138.70	166.50	206.40	17.50	17.50	15.80	12.70	
Cleveland	49.00	52.00	97.50	117.00	149.00	185.00	16.50	16.50	16.80j	14.40j	2.65
Dallas	59.00	62.00	125.00	149.00	155.00	177.00	9.50	24.00	19.00	16.00	.95
Denver	78.50	88.00	141.50	160.65	196.00	222.50	12.00	15.50	25.00j	17.00j	25.00
Detroit	71.85	76.65	143.70	230.00	280.00	325.00	15.00	16.00	18.00	15.00	15.25
Kansas City	64.50	66.50	81.00c	125.50	159.75	186.25	14.00	24.00	18.90	12.60	10.50
Los Angeles	73.50†r	89.50†r	128.00c†r	210.00†r	368.00†r	460.00†r	12.00	14.00	18.70	.....	10.70
Minneapolis	80.35	85.70	146.00	192.85	176.20d	245.20d	13.10	15.10q	21.00	16.00	19.00
Montreal	84.00a	96.00a	180.00a	......	273.00	......	15.50†	20.75†	23.50	17.00	11.00
New Orleans	72.00	72.00	135.00	162.00	180.00	220.00	14.00	.....	18.30	12.60	
New York	87.00	93.00	128.00c	193.30h	238.80h	295.60h	12.50	.....	20.00	15.50	20.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	15.00	18.00	16.10q	11.40q	10.90
Pittsburgh	58.40	62.30	116.85	165.00	217.00	250.00	17.50	25.00	17.50	15.20	2.30
St. Louis	62.00	65.00	120.00	180.00	234.00	280.00	16.00	17.00	.55k	.40k	2.00
San Francisco	84.00	94.50	225.00	......	......	......	15.00	18.00	.55o	.40o	2.05
Seattle	90.00	100.00	200.00	......	......	......	18.00f	18.00	20.00	20.00	28.00

STRUCTURAL CLAY TILE: *a* Smooth. *b* Carload lots delivered to job. *c* 6 x 12 x 12 in. *d* Not load bearing. *e* 8 x 8 x 8 in. only. BRICK: *f* Less $1.00 cash 15 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* 50c. per M off for cash. LIME: *j* LCL. *k* Per sack. *l* Lump. *m* Per bbl., 180 lb. *n* Per sack, 100 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag. *q* 15-ton cars. *r* 5% 10 days discount. † F.o.b.

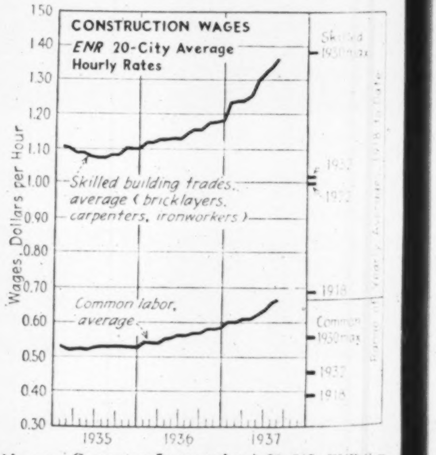
PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in 500-lb. lots in oil	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES Carload lots f. o. b. factory				
			Graphite *b*	Aluminum *c*	Ferric Oxide *d*	Rolls, slate surfaced, 85-90 lb., per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 350 lb. bbl. per ton
Atlanta	$9.75	$12.375	$1.62	$3.17	$1.40	$2.68	$2.36	$2.36	$.36	$29.40
Baltimore	9.50	12.00	1.45	2.25	1.70	2.16	3.25	3.25	.40	27.00
Birmingham	9.75	12.375	2.35	2.35	1.85	2.16	2.14	2.14	.45	29.25
Boston	9.50	12.00	1.70‡	2.30‡	.045e‡	1.96‡	2.25h‡	2.14h‡	.45‡	20.00‡
Chicago	9.50	12.00	1.80	....	....	2.47	2.37	2.37	.43	33.00
Cincinnati	9.50	12.00	1.45	2.50	1.40	2.40	2.39h	2.39h	.36	21.00
Cleveland	9.50	12.00	1.90	2.60	1.40	2.10	2.14h	2.14h	.32	29.00
Dallas	9.75	12.75	1.80	2.10	....	2.75h	2.50h	2.50h	.60	60.00
Denver	10.00	12.50	2.55	....	....	2.65	4.00	4.00	.35	30.00
Detroit	9.50	12.00	1.80	2.50	1.50	2.30	2.65	2.50	.35	30.00
Kansas City	9.50	12.125	2.15g	2.40g	1.67g	1.93	3.15	3.15	.25	25.00
Los Angeles	9.75	12.25	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	9.50	12.125	....	....	....	1.85i	1.78hi	1.78hi	.29	23.80
Montreal	....	8.20	2.00f	4.75f	2.40f	2.50	1.60	1.83	.50	1.52
New York	9.50	12.00	1.90	2.60	1.65	1.85	1.87h	1.87h	.033e	26.00
Philadelphia	9.50	12.00	2.515	2.94	1.515	1.95	2.86h	2.86h	.29	26.00
Pittsburgh	9.50	12.00	1.05	1.95	.80	1.95	1.94h	1.94g	.34	26.00
St. Louis	9.50	12.00	1.70/1.90	2.50/2.60	1.50/1.80	1.90h	2.70	2.70	.25/.30	28.00
San Francisco	9.75	12.00	1.80	2.75	1.10–2.00	1.66	1.90	1.90	.325	20.50
Seattle	9.75	12.25	1.80	2.85	2.20	1.98	2.42	2.60	.73	28.00k

‡ Delivered. RED LEAD: Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. READY MIXED PAINT: *b* U. S. War Dept. Spec. 3–49A. *c* ASTM Spec. D266–31. *d* 80% maximum ferric oxide. *e* Per lb. *f* Sales tax included. *g* 5 gal. cans. ROOFING: *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Per 100 lb. *k* Asphalt pitch.

SKILLED AND COMMON WAGE RATES—PER HOUR

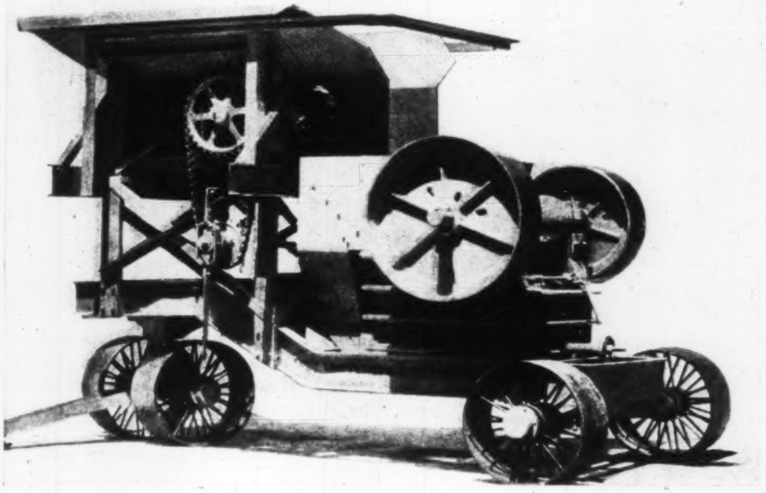
	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor	
						Building	Heavy Const.
Atlanta	$1.25	$0.40/1.00	$1.00/1.25	$1.00/1.25	$1.25	$0.40/.50	$0.40/.50
Baltimore	1.25	1.25	1.50	1.50	1.25	.45	.45
Birmingham	1.50	1.125	1.25	1.125	1.00	.30/.40a	.30/.40a
Boston	1.50	.90/1.375	1.375	1.00/1.375	1.625	.60/.85	.60/.85
Chicago	1.70	1.625	1.625	1.625	1.70	1.025	1.025
Cincinnati	1.00/1.625	.70/1.35	1.40	1.00/1.40	1.00/1.625	.60/.75	.60/.75
Cleveland	1.625	1.375	1.50	1.50	1.50	.90	.90
Dallas	1.25	1.00	1.00	1.00	1.25	.40	.40
Denver	1.50b	1.50b	1.43b	....	1.43b	.714b	.714b
Detroit	1.50	1.25	1.50	1.50	1.55	.75/.80	.75/.80
Kansas City	1.325	1.25	1.25	1.25	1.45	.80	.45/.50
Los Angeles	1.10	1.10	1.125	1.25	1.25	.625	.625
Minneapolis	1.375	1.25	1.50	1.40	1.50	.85	.85
New Orleans	1.00	.75/1.00	1.00/1.25	1.00	1.00	.30/.40	.30/.40
New York	1.886b	1.75b	1.925	2.00b	2.00	.95	.60/.85
Philadelphia	1.50	1.00	1.375	1.50	1.375	.40/.50	.40/.50
Pittsburgh	1.75	1.50	1.50	1.25	1.75	.80	.70
St. Louis	1.50	1.25	1.75	1.57/1.75	1.50	.875	.45/.875
San Francisco	1.75c	1.50	1.50	1.50	1.50c	.75	.60
Seattle	1.60c	1.25c	1.50c	1.50c	1.60c	.90c	1.00c
Montreal *d*	.70	.60	.65	.55	.70	.40	.35



a PWA *b* 7 hr. day. *c* 6 hr day. *d* 10c per hr. increase effective August 12. **ENR Skilled Average:** (Bricklayers, Carpenters, Ironworkers) **$1.369** ENR **Common Average: $0.668**.

NEW AIDS TO THE CONSTRUCTOR

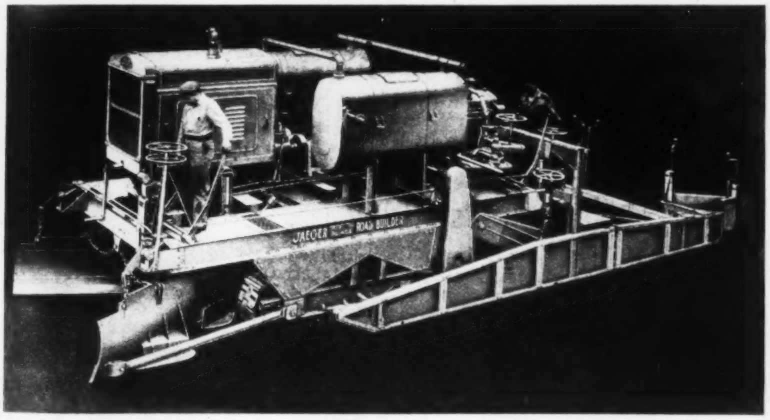
Equipment and material announcements and manufacturers' news



Portable Crusher Unit

A feeder-crusher unit recently developed by the Universal Crusher Co. of Cedar Rapids, Iowa, involves the use of a universal primary jaw crusher mounted on a portable rig together with an apron feeder superimposed above.

This crusher-feeder combination operates in conjunction with a similar unit on which is mounted a roll crusher for secondary crushing. A belt conveyor carries the primary crusher rock from one crusher to the other.



Mixed-in-Place Construction With New Machine

Heavy retreads and stabilized bases up to 9 in. in depth when compacted may be built by means of one-pass mixing-in-place with the new self-propelled model MG-2 road builder of the Jaeger Machine Co. of Columbus. Only two men are required on the machine.

The machine is a combination of two units, a twin pug-mill mixing unit and a spreader-finisher unit. In addition to the pug-mill, the mixing unit includes gathering plows and screws and storage tanks and pumps to handle the binder. The finisher unit consists of an adjustable strike-off mounted on 21-ft. floating straight-edge runners which equalize subgrade irregularities and lay out a smoothly finished surface. Propulsion is provided by heavy-duty crawlers driven by a 130-hp. engine and steered by individual clutches.

The machine will use either windrowed material or earth taken directly from the grade after preliminary scari-

USE A PUMP THAT *Goes Places* to save Time and Money

Weighs 93 pounds complete

Pumps 15,000 gallons per hour

If you want a light weight pump that you can get around quickly—set up in hard-to-reach locations—a Homelite is the pump for you. For a Homelite 3" pump weighs only 93 pounds complete with built-in gasoline engine—light enough for a man to carry. Yet it has the capacity to handle heavy jobs with money-saving speed—delivers 15,000 gallons of water per hour.

Furthermore it handles seepage and thick muddy water continuously—dependably. Primes itself—keeps water down to strainer level at all times—operates without manual attention. Guaranteed suction lift 28'. Air cooled gasoline engine starts quickly in any weather—won't flood, freeze, or overheat.

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Please send me your bulletin giving complete facts on the 3" self-priming Homelite Pump—without obligation.

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fication. The gathering plows have a spread up to 11 ft. and are adjustable so that when gathering material direct from scarified grades, the operator can cut to exact grade. When windrows are being gathered from an established subgrade, the plows are allowed to float freely on sliding shoes following the subgrade.

A two-way spreading screw at the rear of the twin pug-mill controls the distribution of mixing material to the strike-off. Lanes of 9 to 10 ft. may be spread and finished.

Where immediate laying of the mixed materials is not desired, the finishing unit may be removed from the mixing unit and material left in windrows for aeration or other handling.

• • •

Abrasion Meter

The Tabor Instrument Co., North Tonawanda, N. Y., has announced the Tabor Abraser, a testing machine for measuring the wear resistance, toughness, adhesion and rub-off qualities of surface finishes.

The device consists of a motor driven rotating specimen holder and two grinding wheels on a pivoted housing. A scale beam attachment carries a blade by which the toughness and dig resistance of the finish may be measured.

• • •

Protective Coatings

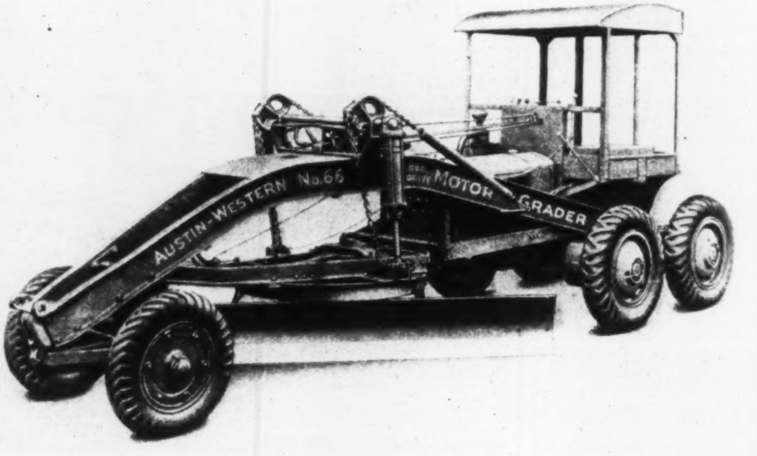
A new series of protective coatings for iron, cement and wood which are said to be proof against acid, alkali, moisture and heat is being manufactured by May Products, Inc., of Newark, N. J. These coatings, known as Mayco, consist of a combination of stable rubber derivatives and inert pigments with suitable solvents. As they age they become hard and resistant to mechanical stresses. The films are fire resisting and are not affected by heat up to 250 deg. F.

• • •

Blast Hole Drill

The Bucyrus-Erie Co., of South Milwaukee, has just added Model 27-T to their Bucyrus-Armstrong line of blast hole drills; it is an 18,400-lb. rig with a tool capacity of 2000 lb.

Outstanding features claimed for the new 27-T includes a new built-in tool wrench, special bumper reel, large operator platform, rubber-insulated tool guide and sheaves, rubber shock absorber under the crown sheave, and a fast highly-penetrating drilling action. The 27-T is furnished with 33 or 40 ft. Caterpillar-type mounting, and a choice of gasoline, diesel or electric power.



Diesel Motor Grader

A Buda diesel engine, built by the Buda Co., of Harvey, Ill. is a feature of the new Model 66 motor grader of the Austin-Western Road Machinery Co. of Aurora, Ill.

The grader is equipped with hydraulic control, is available in either single or dual drive, and has a wide range of speeds and a 50 in. blade surface. The Austin anti-chatter device is designed to eliminate blade chatter and permit a smooth, even cut.

The power unit is the small 6-cylinder Buda with a 275 cu.in. displacement.

NEW PUBLICATIONS

Six Grades of Armco stainless steel are described, and corrosion resistant data and proper heat data, are given for these stainless steels in a 24-page booklet entitled "Armco Stainless Steels" published by the American Rolling Mill Co., Middletown, Ohio.

On Construction Jobs with Caterpillar Products is the title of a new illustrated booklet issued by Caterpillar Tractor Co., Peoria, Ill.

V-belt Replacements is the title of a 30-page catalog issued by Rockwood Mfg. Co., Indianapolis. It contains a list of users of V-belts and a list of the applications of these belts required by each.

Amber's properties in relation to its use as an electrical insulation are listed in condensed tabular form in a folder "Amber 20,000,000 Years In the Making," issued by Amber Mines, Inc., of New York City.

Thirty Pages of text and a number of relevant tables are gathered into an attractive bulletin on "The Use of Monel in Dam Construction" by the International Nickel Co. of New York City. The bulletin describes a number of interesting applications for which monel was specified and gives detailed engineering information on the work.

Direct Burial of cables underground is possible with the non-metallic sheathed cable cataloged by the Anaconda Wire & Cable Co. of New York City in the 20-page booklet "Anaconda Duraseal Cable." Information on selection and installation of the cable and other engineering data is included.

A Catalog of various types of pipe unions has recently been issued by E. M. Dart Mfg. Co., of Providence.

A Very Complete 157-pg. catalog of instruments for engineers, surveyors and builders has been issued by David White Co. of Milwaukee.

Indicating and recording temperature and pressure instruments are described by C. J. Tagliabue Mfg. Co. of New York City in their new 57-page catalog No. 1060-C. Some interesting installation photographs are included.

A Variety of uses for Caterpillar diesel engines are shown in pictures and brief captions in a new booklet, "Places for Power," published by the Caterpillar Tractor Co. of Peoria, Ill.

Safety and convenience features of the Inland 4-way steel floor plates are attractively described in a booklet put out by the Inland Steel Co. of Chicago.

New Edition of the B. F. Goodrich Co.'s "Operators Handbook" is pocket-size and contains 66 pages of factual information and data tables on tires in commercial service. A complete description of all the company's tire and tube products for trucks, buses, tractors and farm implements is included.

COMPLETE ROCK BIT SERVICE . . .

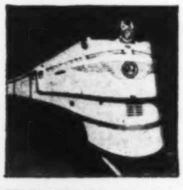
for Contractors

When you adopt TIMKEN Rock Bits you will get not only the finest rock bit that can be made but also an organized service that assures the full realization of the many economies the removable rock bit affords.

Timken Authorized Distributors are located in all sections of the country. They carry complete stocks of TIMKEN Bits and can furnish any quantity of any size or type promptly at any time.

Timken Authorized Conversion Shops operated in conjunction with Timken Authorized Distributors make the conversion of existing steel for use with TIMKEN Bits convenient and economical. These shops can also furnish new steel in any size and length—round or hexagon—ready for use. There's a Timken Authorized Distributor and Timken Authorized Conversion Shop within telephone call.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO



HIAWATHA, Timken Bearing Equipped streamlined flyer of the Milwaukee Road

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

TIMKEN
ROCK BITS

(Contract Unit Prices continued from page 286)

HARBOR DREDGING, CONNECTICUT

OWNER: U. S. War Department; E. W. Crawley, Senior Engineer, Providence, R. I.

PROJECT: Dredging in Fivemile River Harbor in a channel 100 ft. wide and 3,000 ft. long, above the plane of 8 ft. below mean low water; in Norwalk Harbor in a channel 75 ft. wide and 2,700 ft. long, above the plane of 7 ft. below mean low water.

BIDS: Five bids were opened June 23, 1937, ranging from a low of $23,987 to a high of $33,034.

CONDITIONS: Work is scheduled for completion within five months after contract award with minimum hourly wage rates stipulated of $1.125 for skilled and 50c. for common labor. The mean tide range is about 7.2 ft. with the site of the work well protected and no obstructions enroute to dumping grounds.

LOW BIDDERS: Based on 83,000 c.y.

1. U. S. Packard Dredging Co., Boston, Mass.	$23.987
2. Herbert T. Gerrish, Boston, Mass.	27,971
3. Bay State Dredging & Contracting Co., East Boston, Mass.	28,967

Bidder, Proposed Method and Unit Price

1. By dipper and hydraulic dredges	$0.289
2. By hydraulic dredge	0.337
3. By clamshell dredge	0.349
4. Engineers' estimate	0.31

RESURFACING NEPAUG DAM, CONN.

OWNER: Board of Contract & Supply, Hartford, Conn.; C. M. Saville, engineer.

PROJECT: Resurfacing 25,000 sq. ft. of spillway section with reinforced Gunite, possibly also including similar resurfacing on 5,000 sq. ft. of non-overflow section, on the Nepaug Dam in New Hartford, Conn.

BIDS: Four bids were opened in July 1937 ranging from the low of $15,978 to a high of $30,535, with materials furnished by the owner and contract completion scheduled for 3½ months after award of contract. Bidding was confined specifically to those contractors having experience with and equipment for Gunite work.

LOW BIDDERS:

1. Pneumatic Concrete Co., Edgewood, R. I.	$15.978
2. Cement Gun Co., Allentown, Pa.	24.538
3. Wirts Co., New York, N. Y.	25.696

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Overflow section cement	1,250 bag	$2.15	$3.27	$3.214
2. Mesh reinforcing	20,000 lb	.125	.15	.2214
3. Copper	2,000 lb.	.55	.82	.6679
4. Non-overflow section cement	1,000 bag	2.60	5.00	5.123
5. Mesh reinforcing	4,000 lb.	.16	.25	.283

HIGHWAY SURFACING, CALIF.

OWNER: State Highway Commission, Sacramento, Calif.

PROJECT: Construction of 3.3 miles of grading and surfacing with plant mixed asphalt, medium curing type on crusher run base, between San Luis Obispo Creek and Cuesta siding in San Luis Obispo Co., Calif.

BIDS: Opened May 19, 1937 provided for alternative types of metal and reinforced concrete header, with the former indicating a 15 per cent lower cost on the basis of the low bid submitted.

CONDITIONS: Traffic is to be under direct control of the contractor, and it is estimated that such duty will add greatly to the cost due to the heavy grades on the temporary roads. Also there is included a divided roadway with a 4 ft. centre section protected by 33,350 ft. of temporary timber curb. Minimum hourly wage rates are stipulated of $1.00 for skilled and 60c for common labor.

LOW BIDDERS:

1. Metropolitan Construction Co. Los Angeles, Cal.	
Alternative A (metal headers)	$646.023
Alternative B (concrete headers)	651,255
2. George Pollock Co. Sacramento, Cal.	
Alternative A	666.634
Alternative B	671.532
3. Macco Construction Co. Clearwater, Cal.	
Alternative A	683.133
Alternative B	684.101

Item	Quan.	Unit Prices		
1. Clear, grub	170 sta.	$50.00	$50.00	$25.00
2. Water	8.400 M.g.	.75	1.00	1.25
3. Roadway excav. uncl.	915,000 c. y.	.30	.245	.23
4. Struct. excav	16,200 c. y.	1.00	1.00	1.25
5. Ditch, channel excav	6,100 c. y.	.75	.70	.185
6. Overhaul, sta. yd.	3,310,000 c. y.	.0025	.015	.008
7. Imported borrow	44,200 c. y.	.50	.60	.60
8. Trench excav	98,000 c. y.	.30	.30	.36
9. Rock fill	16,000 c. y.	2.35	1.50	2.10
10. Concrete demolition	4,400 c. y.	1.00	2.00	2.50
11. Scarify, level	38 sta.	15.00	10.00	12.00
12. Finish road	170 sta.	20.00	10.00	12.00
13. Crusher run base	22,500 ton	1.65	2.00	2.20
14. Mineral aggreg. surfacing	17,500 ton	1.90	2.60	3.05
15. Liquid asphalt, ROMC-4,5.	915 ton	18.00	16.00	20.50
16. Liquid asphalt, SC-2, prime.	90 ton	10.00	10.00	13.35
17. Liquid asphalt, SC-4, surf.	27 ton	13.00	17.00	17.00
18. Liquid asphalt, SC-1A, pen.	7 ton	13.00	14.00	15.00
19. Liquid asphalt, SC-2, surface	455 ton	10.00	10.00	13.35
20. Mix, shape passages	37,500 s. y.	.08	.10	.10
21 Liquid asphalt seal	85 ton	18.00	21.00	20.50
22. Screenings, seal coat	1,050 ton	3.00	3.50	3.00
23. Conc. cl. A, struct	270 c. y.	22.00	30.00	42.50
24. Reinforcing steel	23,000 lb.	.06	.06	.10
25. Conc. cl. A, channel	65 c. y.	16.00	30.00	36.00
26. Mesh reinf., channel	380 s. y.	.50	.50	.50
27. C. M. pipe, 8 in	1,086 l. f.	.80	1.00	1.25
28. C. M. pipe, 18 in	3,146 l. f.	1.00	2.00	2.00
29. C. M. pipe, 24 in	1,644 l. f.	2.50	2.75	3.00
30. C. M. pipe, 30 in. 14 ga	206 l. f.	3.25	3.50	3.80
31. C. M. pipe, 30 in. 12 ga	250 l. f.	4.00	4.25	4.90
32. C. M. pipe, 36 in. 12 ga	530 l. f.	5.00	5.00	6.10
33. C. M. pipe, 36 in. 10 ga	1,412 l. f.	5.80	6.50	7.30
34. C. M. pipe, 42 in. 10 ga	92 l. f	6.75	8.50	9.00
35. C. M. pipe, 60 in. 8 ga	204 l. f.	13.00	15.00	15.75
36. Underdrains, perf., 8 in	6,754 l. f.	.80	1.00	1.10
37. Underdrain rock fill	750 c. y.	3.00	1.50	3.05
38. Relay present pipe	330 l. f.	1.00	.75	1.25
39. Remove, salvage pipe	254 l. f.	1.00	.50	.60
40. C. M. pipe, 75 in. m.p. 410-18	390 l. f.	15.00	15.00	18.05
41. C. M. pipe, 75 in. m.p. 47-15	300 l. f.	20.00	20.00	20.00
42. C. M. pipe, 105 in. m.p	170 l. f.	20.00	25.00	25.00
43. C. M. pipe, 120 in. m.p	300 l. f.	40.00	45.00	49.00
44. Spillway assemblies	39 ea.	12.00	14.00	17.00
45. Drop inlet frames, covers	32 ea.	40.00	50.00	57.00
46. Redwood timber inlet covers	30 ea.	10.00	5.00	12.00
47. Laminated guard railings	14,535 l. f.	.90	.90	1.25
48. Culvert markers	55 ea.	2.50	4.00	3.00
49. Property fences	6.8 mi.	700.00	650.00	700.00
50. Drive gates	10 ea.	20.00	20.00	15.00
51. Timber curb	35,550 l. f.	.30	.30	.35
52. Monuments	75 ea.	3.00	4.00	3.00
ALTERNATIVE A.				
1. Metal headers, 6x6 in.x4 ft.	271 ea.	4.10	5.00	4.70
2. Metal headers, 6x6 in.x 6 ft.	1,467 ea.	5.10	6.00	5.90
3. Metal headers, 6x6 in.x 8 ft.	218 ea.	6.10	7.25	7.00
4. Metal S.B. headers, 6x6 in. x 8 ft	69 ea.	6.25	7.50	7.20
5. Metal stretcher, 6x8 in.x 6 ft	4,169 ea.	4.35	5.25	4.60
6. Metal header caps	1,682 ea.	.15	.30	.25
7. Metal header spacers	218 ea.	1.00	1.25	1.15
8. Metal header inserts	287 ea.	.60	.90	.65
9. Gap fillers	4 ea.	25.00	30.00	40.00
10. Stretcher inserts	301 ea.	.70	.75	.90
ALTERNATIVE B.				
1. Reinf. conc. headers, 5x6 in.x 6 ft.	544 ea.	3.80	5.00	3.64
2. Reinf. conc. headers, 5x10 in.x 6 ft.	2,357 ea.	5.25	6.00	5.02
3. Reinf. conc. stretchers, 6x6 in.x 6 ft.	2,204 ea.	3.25	4.00	3.18
4. Reinf. conc. stretchers, 6x8 in.x 6 ft.	2,126 ea.	3.80	4.25	3.66
5. Reinf. conc. stretchers, 6x10 in.x 6 ft.	1,082 ea.	4.60	5.25	4.40
6. Conc. filler blocks, 10x6x10 in	18 ea.	.50	1.50	1.00

NEW AIDS TO THE *CONSTRUCTOR*

Equipment and material announcements and manufacturers' news

Excavator for Hillsides

The Insley Manufacturing Corporation of Indianapolis, has produced, in the Hill-Billy, an excavator which will work on steep hillsides in a level position, avoiding the necessity of building cribs under the crawlers to prevent burnt-out motors and clumsy operation. Further to adopt the machine to rough-country operation, the motor is provided with an emergency reserve power feature. It is governed at 1,450 r.p.m., at which speed it develops 45 hp., and will travel at a speed of ½ m.p.h. in low and 2 m.p.h. in high. On a steep grade, or when more speed is wanted, the operator uses an accelerator which will increase power beyond the range of the governor.

The tilting feature is obtained by pivoting the entire upper frame around an axle piece mounted in the crawler frame. The upper frame can be tilted freely in either direction and locked in the desired position to a maximum tilt of 32 deg. Tilting is not done by the use of power, but by extending the boom to overbalance the machine.

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Woodworking Machine For Construction

DeWalt Products Corporation has announced a new model woodworking machine for use in the construction industry. It is built on the same principles as other DeWalt models, but is a great deal more rugged and sturdy to care for the heavier requirements of construction work. The machine is rigidly mounted on cast semi-steel supporting columns and cantilever arm and has a heavy-gage metal table and legs. The direct-drive motors are available in 5 to 15 hp. and will cut material in timber sizes as large as 16x16 in.

The model has three 360-deg. adjustments; the cutting unit can be turned to any desired position, as well as moved across the table on its supporting track, and the track arm can be rotated on the adjustable supporting column.

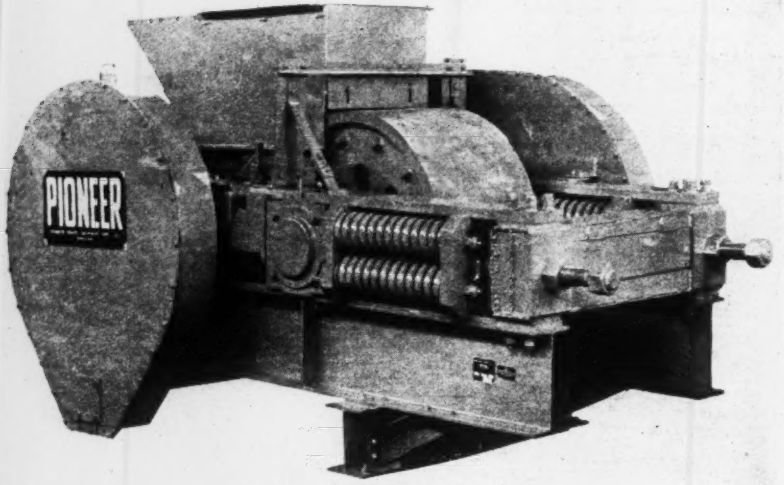
Light Foot Guard

An aluminum foot guard weighing only 12 ounces, yet said to be capable of withstanding a direct blow of 300 ft.-lb., has been developed by Ellwood Safety Appliance Co., Ellwood, Pa. The Sankey foot guard weighs no more than an ordinary rubber overshoe and can be fitted to any size shoe without special adjustment. A three-point suspension reduces vibration and discomfort.

Gasoline Operated Tamper

An explosion-type tamper, recommended by its maker for tamping small fills and trench backfills, and which can also be converted into a pavement breaker or pile driver, has been developed by The Calhoun Co., of Los Angeles. Although the machine weighs 220 lb., it is designed for one-man operation and can be run with one hand. It operates on either benzol or aviation gasoline. Ignition is by a 6-volt motorcycle battery carried on the operator's back and controlled by a push-button located on one of the handles. It hops about 18 in. vertically and is guided by inclining the machine in any direction desired.

The machine, known as the Delmag Model E Tamper, has changeable bases which convert it from a tamper to a hammer for driving piles and sheeting. Other bases are available which adapt the machine to concrete breaking, concrete tamping and tamping of gravel roadways and cobble stones for highway work.



Roll Crusher

The new Super-40 roll crusher of the Pioneer Gravel Equipment Mfg. Co. of Minneapolis obtains a 6½ to 1 power ratio through the use of a pinion drive on the countershaft. Star gears on the opposite ends of the stationary roll transmit the power to the floating roll, permitting full adjustment between the rolls and allowing free action of the floating roll against the safety springs.

The opening between the rolls can be adjusted for various size products by moving the floating roll. After the crusher is adjusted, a back stop wedge pulls the rolls apart to the desired opening, preventing an excess production of fines. The floating roll is held against the back stop wedge by eight springs which have 3 in. of safety and protect the crusher against damage from foreign materials or choking.

Low Cost Welder

A low cost alternating-current welder for use in maintenance and repair as well as light construction work has been developed by the Westinghouse Electric & Mfg. Co., East Pittsburgh, in the Midget Marvel a-c welder. The new welder, comprising a special transformer and control designed for a-c arc welding and with a claimed efficiency of 87 per cent at normal load, sells complete with all accessories pictured for operation on 60 cycle current, for $123.50.

The welder has a current range of from 30 to 140 amp. with 12 steps of current adjustment. The secondary open voltage is 50 on low range and 55 on the high. The set is designed for use with coated electrodes from 1/15 in. to 5/32 in. in diameter.

Portability is provided by the handles on the set and the four large rubber swivel casters. The 60 cycle set weighs 112 lb., and the extreme dimensions are 14x11x18 in. including handles.

MANUFACTURERS' ACTIVITIES

MIDDLE WEST and Far West have been brought together in the pumping field with the joining forces of Smith-Booth-Usher Co. of Los Angeles and the firm of Yeomans Brothers Co. of Chicago.

MARIS BROS., INC., manufacturers of cranes and hoists for the past 50 years at 56 and Grays Ave., Philadelphia, have sold their entire business to Mr. G. A. Whitehead, Philadelphia distributor of Owen clamshell buckets and grapples.

AMERICAN MANUFACTURERS of road construction machinery interested in selling in Peru have been invited to send their catalogs, price lists and full data in duplicate to the Peruvian Consulate, located at 2314 Locust St., Philadelphia.

New Distributors

HERCULES CO., Marion, Ohio, has recently appointed the following distributors for their line of road rollers: Jackson Machinery Co., New Orleans; Bublitz Machinery Co., Kansas City; Industrial Tractor & Equipment Co., Nashville; Moriarty Machinery Co., Toledo; Tractors, Inc., Providence; J. F. Murphy Engineering Co., Memphis; Lewis Patten Co., San Antonio; C. O. Monat Co., Ltd., Montreal.

INDUSTRIAL TRACTOR & EQUIPMENT Co., Inc., Baton Rouge, La., is distributor in southern Louisiana for Adams road, maintenance and construction machinery.

GAR WOOD INDUSTRIES, INC., has appointed Engineering Industries Limited, Dominion Building, Leaside, Ont., to act as distributors for the company's heating and air conditioning products throughout the entire Dominion of Canada.

LEROI-RIX MACHINERY CO., 3817 Santa Fe Ave., Los Angeles, and the Rix Co., 582-6th St., San Francisco, are new West Coast distributors of "Williams" clamshell and dragline types of buckets for the Wellman Engineering Co., Cleveland.

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Floor Plate Price Change

The Inland Steel Co. has announced a price reduction, effective August 1, of 30 cents per hundred pounds on its Inland 4-Way Floor Plate. For third and fourth quarter shipments, the base price will be $3.55 per 100 lb., f.o.b., Chicago.

$$\$1^{\underline{00}} = \$2^{\underline{75}} = \$412^{\underline{50}} = \$575^{\underline{00}}$$

(or)

Pavement Maintenance Costs

at RICHMOND, VA.

East Main St., Richmond, is brick paved for 40 blocks through the heart of the city.

MAINTENANCE EXPENSE OF THE PRINCIPAL TYPES OF STREET PAVEMENTS, RICHMOND, VIRGINIA

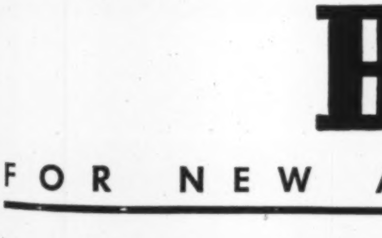
From the Annual Report of the Director of Public Works for the Year 1936

Type	Total Sq. Yds.	Sq. Yds. Replaced	Total Cost	Unit Cost per Sq. Yd. for all Maintenance	Comparative Index
Vitrified Brick	**282,726**	**16**	**$23.47**	**$0.00008***	**1.00**
Pavement Type A	297,696	36	65.34	0.00022	2.75
Pavement Type B	1,237,256	33,487	40,505.67	0.033	412.50
Pavement Type C	180,984	3,951	8,383.54	0.046	575.00

*"Maintenance due to causes other than the failure of the Vitrified Brick."

● Of course, you've always known that of all the pavement types, brick is far less expensive to maintain. But how those official figures for Richmond, Va., give point and definite form to an old truth!

Brick maintenance for 1/575th of the maintenance cost of another well-known type is quite a lot of difference!



So. 2nd Street was brick paved last year.

Brick pavements are now in daily use after nearly 50 years of exposure to weather and traffic. With such a long life and such a low maintenance, brick is indeed the greatest of all paving values!

The reason for long life and low cost of brick pavement is due to the fact that it withstands weather as well as traffic. Changes in temperature and atmospheric moisture damage most pavements. Brick is more highly resistant to these natural causes of damage than any other type. In addition it is highly resistant to traffic damage.

Use vitrified brick on new jobs. Various types of old pavement may be easily resurfaced with brick. National Paving Brick Association (Affiliated with Structural Clay Products Institute), National Press Building, Washington, D. C.

BRICK

FOR NEW AND RESURFACE JOBS

(Contract Unit Prices continued from page 328)

(VI) Quinebaug River Bridge—150 days.

1. Brunalli Const. Co.	$19,698
2. L. E. McLaughlin Inc.	19,775
3. C. W. Blakeslee & Sons	21,888

(VII) French River Bridge—150 days.

1. N. Benvenuti & Sons	$30,883

(VIII) Norwich Overpass—300 days.

1. A. I. Savin Construction Co.	$112,830
2. D. V. Frione & Co.	112,915
3. S. K. Construction Co.	119,416

I — BIGELOW BROOK BRIDGE

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Clear, grub	l. s.	$50.00	$100.00	$100.00
2. Excav. earth	65 c. y.	1.00	1.00	1.50
3. Excav. rock	10 c. y.	2.00	4.00	4.00
4. Excav. unclass	285 c. y.	3.00	3.00	4.50
5. Borrow	80 c. y.	.50	1.00	1.00
6. Conc. Cl. "A"	26 c. y.	16.00	18.00	20.00
7. Reinf. bars	3,030 lb.	.05	.06	.07
8. Cem. rubble masonry	149 c. y.	12.00	11.00	12.00
9. Struct. steel	1,050 lb.	.10	.10	.10
10. Wire rope railing	100 l. f.	.40	.50	.50
11. Wire rope	100 l. f.	.10	.20	.25
12. Single posts	4 each	1.50	2.00	2.00
13. Temp. bridge approaches.	l. s.	75.00	200.00	400.00
14. Comp. type anchorages	2 each	10.00	10.00	12.00
15. Type C anchorages	2 each	8.00	9.00	10.00
16. Loose gravel surf	65 c. y.	1.00	1.00	1.25
17. Portland cement	190 bbl.	2.50	3.00	3.00

II — NORWALK RIVER BRIDGE

1. Excav. unclass	5,105 c. y.	$1.00	$2.00	$3.00
2. Conc. Cl. "A"	3,743 c. y.	13.00	14.00	14.00
3. Cork joint filler, ½ in	880 s. f.	.35	.50	.40
4. Reinf. bars	378,200 lb.	.04	.04	.045
5. Struct. steel shapes	59,860 lb.	.03	.03	.05
6. Cement rubble masonry	75 c. y.	13.00	20.00	14.00
7. Catch basin	1 each	60.00	60.00	90.00
8. Furnish steel piles	667,000 lb.	.03	.027	.03
9. Drive steel piles	16,149 l. f.	.30	.49	.35
10. Pave slope	596 s. y.	1.00	1.00	2.00
11. Waterproof painting	4,030 s. y.	.10	.20	.20
12. Excav. channel	4,300 c. y.	1.00	.10	.50
13. Portland cement	5,786 bbl.	2.10	1.90	2.20

(III) MAIN AVE. BRIDGE, NORWALK

1. Excav. unclass	2,409 c. y.	$2.25	$0.50	$1.00
2. Conc. pavement	112 c. y.	9.75	6.00	6.00
3. Conc. Cl. "A"	1,903 c. y.	13.00	14.00	13.00
4. Cyclopean conc	1,650 c. y.	6.50	9.00	8.00
5. Cork joint filler, ½ in	930 s. f.	.49	.50	.50
6. Reinf. bars	166,046 lb.	.041	.04½	.04
7. Steel fabric, 6x6 No. 6	420 s. y.	.25	.30	.30
8. Dimens. stone masonry	73 c. y.	75.00	75.00	90.00
9. Random rubble masonry facing	230 c. y	25.00	35.00	35.00
10. Waterproof painting	710 s. y.	.15	.20	.20
11. Membrane waterproofing.	500 s. y.	1.00	1.35	1.20
12. Portland cement	4,065 bbl.	2.26	2.10	3.00

(IV) MASHAMOQUET BROOK BRIDGE

1. Clear, grub	l. s.	$500.00	$200.00	$300.00
2. Excav. unclass	125 c. y.	2.00	2.00	3.00
3. Excav. channel	159 c. y.	2.00	1.00	3.00
4. Conc. Cl. "A"	65 c. y.	15.00	20.00	20.00
5. Reinf. bars	9,923 lb.	.05	.06	.06
6. Struct. steel	34,083 lb.	.045	.055	.06
7. Steel bearing piles	18,480 lb.	.04	.045	.05½
8. Drive steel piles	569 l. f.	1.50	1.25	.50
9. Pave slope	150 s. y.	3.00	2.50	3.00
10. Iron bridge rail	100 l. f.	4.00	5.00	5.00
11. Remove superstruct	l. s.	500.00	600.00	300.00
12. Portland cement	101 bbl.	2.80	3.00	3.20

(V) BIGELOW BROOK BRIDGE, FLOETING RD.

1. Clear, grub	l. s.	$100.00	$200.00	$300.00
2. Excav. earth	83 c. y.	1.00	1.00	1.50
3. Excav. unclass	325 c. y.	3.00	4.00	4.50
4. Borrow	400 c. y.	.50	.70	75
5. Form subgrade	425 s. y.	.10	.10	.15
6. Shape slopes, shoulders	219 l. f.	.15	.30	.25
7. Furnish, apply bit. mat	425 gal.	.12	.20	.20
8. Conc. Cl. "A"	87 c. y.	16.00	18.00	20.00
9. Reinf. bars	5,344 lb.	.05	.06	.06
10. Cem. rubble masonry	242 c. y.	12.00	13.00	12.00
11. Struct. steel	11,800 lb.	.10	.06	.06
12. Phosphor bronze	44 lb.	.50	.70	.80
13. Wire fence	130 l. f.	.20	.20	.25
14. Wire rope railing	170 l. f.	.40	.50	.50
15. Wire rope	125 l. f.	.10	.20	.50
16. Single posts	4 each	1.50	2.00	2.00
17. Remove superstruct	l. s.	25.00	100.00	100.00
18. Anchorages, comp. type	2 each	10.00	10.00	12.00
19. Anchorages, type "C"	2 each	8.00	9.00	10.00
20. Furnish, apply sand cover.	850 s. y.	.03	.04	.10
21. Portland cement	320 bbl.	2.50	3.00	3.00
22. Rolled gravel surf	190 c. y.	1.00	2.00	1.90

(VI) QUINEBAUG RIVER BRIDGE

1. Clear, grub	l. s.	$50.00	$500.00	$1,000.00
2. Excav. earth	60 c. y.	1.00	1.00	.75
3. Excav. unclass	400 c. y.	3.00	3.00	4.15
4. Borrow	2,000 c. y.	.40	.30	.50
5. Form subgrade	1,038 s. y.	.10	.10	.10
6. Shape slopes, shoulders	360 l. f.	.15	.20	.15
7. Excav. channel	5,000 c. y.	.50	.60	.40
8. Furn., apply bit. mat	1,038 gal.	12	.12	.13
9. Conc. Cl. "A"	186 c. y.	12.60	15.00	15.75
10. Deformed steel bars	13,970 lb.	.05	.05	.05
11. Cem. rubble masonry	275 c. y.	12.00	12.00	14.00
12. Struct. steel	51,500 lb.	.05	.04	.055
13. Phosphor bronze	78 lb.	.50	.70	.55
14. Wood cribbing	21.5 m.b.f.	100.00	75.00	80.00
15. Rock fill	284 c. y.	1.50	2.00	2.00
16. Timber piles, 30-foot	2,610 l. f.	.25	.10	.25
17. Drive timber piles	2,610 l. f.	.20	.10	.30
18. Load test pile	1 each	100.00	50.00	150.00
19. Furn. equip. to drive pile.	l. s.	200.00	50.00	100.00
20. Rip rap	50 ton	1.00	2.00	1.50
21. Wire fence	160 l. f.	.20	.20	.20
22. Wire rope railing	540 l. f.	.40	.50	.40
23. Wire rope	270 l. f.	.10	.50	.12
24. Single posts	4 each	1.50	1.50	1.50
25. Anchors, compensat. type	4 each	8.00	15.00	9.00
26. Furnish, apply sand cover.	2,076 s. y.	.03	.05	.03
27. Portland cement	500 bbl.	2.50	2.70	2.65
28. Rolled gravel surface	235 c. y.	1.00	1.50	1.25

(VII) FRENCH RIVER BRIDGE

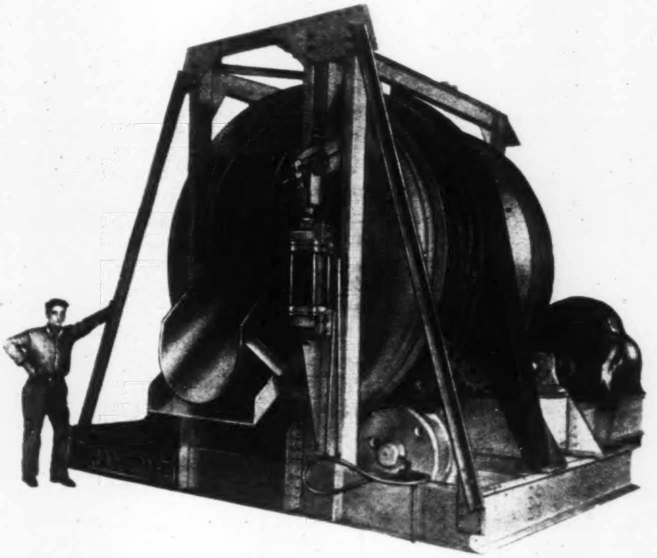
1. Clear, grub	l. s.	$1,000.00	$1,500.00
2. Excav. earth	43 c. y.	1.00	1.00
3. Excav. unclass	1,700 c. y.	5.00	5.00
4. Borrow	1,016 c. y.	.50	.50
5. Form subgrade	960 s. y.	.10	.10
6. Shape slopes, shoulders	335 l. f.	.20	.20
7. Furn., apply bit mat	635 gal.	.15	.20
8. Conc. Cl. "A"	313 c. y.	20.00	20.00
9. Deformed steel bars	15,127 lb.	.05	.05
10. Cem. rub. masonry	650 c. y.	11.00	13.00
11. Struct. steel	53,900 lb.	.0525	....
12. Phosphor bronze	98 lb.	.75	.70
13. Rip rap	50 ton	3.00	2.00
14. Wire rope railing	265 l. f.	.50	.50
15. Wire rope	270 l. f.	.50	.50
16. Single posts	4 each	2.00	1.50
17. Remove temp. footbridge	l. s.	100.00	200.00
18. Anchors, compensat. type	3 each	12.00	15.00
19. Anchors, type "C"	1 each	10.00	20.00
20. Furn. apply sand cover	1,270 s. y.	.05	.05
21. Portland cement	970 bbl.	2.70	2.70
22. Rolled gravel surf	200 c. y.	1.25	1.50

(VIII) NORWICH OVERPASS

1. Clear, grub	l. s.	$2,000.00	$5,390.00	$2,000.00
2. Excav. earth	1,240 c. y.	.50	.40	.90
3. Excav. rock	96 c. y.	1.25	3.00	2.00
4. Excav. unclass	2,650 c. y.	2.00	.70	1.00
5. Excav. trench, 0-5 ft	695 c. y.	1.25	1.25	1.25
6. Excav. trench, 5-10 ft	110 c. y.	1.50	1.50	1.50
7. Borrow	102,422 c. y.	.20	.25	.25
8. Form subgrade	9,537 s. y.	.10	.10	.10
9. Shape slopes, shoulders	2,781 l. f.	.50	.25	.15
10. Fill sub-base, shoulders	800 c. y.	1.00	.40	.40
11. Broken stone (for base)	3,514 ton	1.80	1.60	1.70
12. Broken stone (bit. mac. surf.)	1,462 ton	2.50	2.15	2.00
13. Bit. mat. asph. penetrat'n.	23,803 gal.	.12	.12	.10
14. Bit. mat. tar, surf. treat	1,416 gal.	.15	.12	.12
15. Conc. Cl. "A"	1,892 c. y.	12.00	11.00	13.50
16. Conc. Cl. "B"	24 c. y.	12.00	12.00	12.00
17. Expans. joint filler, ½ in	530 s. f.	.15	.10	.20
18. Deformed steel bars	111,349 lb.	.04	.04	.05
19. Steel fabric, 2 x 2 in	675 s. y.	.35	.50	.30
20. Catch basin, type "A"	3 each	60.00	60.00	70.00
21. Catch basins, curb type	3 each	75.00	75.00	70.00
22. Manhole	1 each	60.00	100.00	90.00
23. Struct. steel	105,000 lb.	.04	.04	.04
24. Phosphor bronze	123 lb.	.50	.60	.60
25. Reinf. conc. pipe, 15 in	276 l. f.	1.40	1.35	1.40
26. Reinf. conc. pipe, 18 in	348 l. f.	1.75	1.70	1.90
27. Reinf. conc. pipe, 24 in	96 l. f.	2.50	2.40	2.40
28. Vit. tile, 6 in	176 l. f.	.50	.70	.50
29. Galv. iron pipe, 2 in	84 l. f.	.35	1.00	.50
30. Steel bearing piles	454,770 lb.	.027	.027	.0308
31. Drive steel piles	10,530 l. f.	.20	.10	.15
32. Steel sheet piles,	40,000 lb.	.02	.03	.02
33. Load test piles	2 each	150.00	300.00	200.00
34. Equip. to drive test piles.	l. s.	400.00	300.00	300.00
35. Bit. gutter	10 s. y.	1.50	2.00	2.00
36. Conc. bridge rail	113 l. f.	5.00	5.00	6.00
37. Wire rope railing	3,116 l. f.	.40	.40	.40
38. Anchors, type "B"	4 each	12.00	12.00	12.00
39. Single posts	8 each	1.50	1.50	1.50
40. Reset, repaint wire railing	855 l. f.	.20	.20	.20
41. Anchors, compensat. type.	13 each	10.00	10.00	8.00
42. Anchors, type "C"	3 each	10.00	10.00	10.00
43. Surface, cem. mortar	4,615 s. f.	.35	.35	.35
44. Surface, loose gravel	175 c. y.	1.00	.50	.90
45. Furn. apply sand cover	2,832 s. y.	.05	.03	.03
46. Portland cement	3,025 bbl.	2.50	2.38	2.70
47. Rolled gravel surf	159 c. y.	1.50	.75	1.10
48. Excav. channel	1,221 c. y.	.40	.50	1.00
49. Excav. loam	1,500 c. y.	.50	.25	.30
50. Wood curb	2,356 l. f.	.40	.35	.40
51. Gravel sidewalk surface treated	1,395 s. y.	.40	.50	.50
52. Rock fill	891 c. y.	1.50	1.25	2.00
53. Loam, seed slopes	556 s. y.	.50	.25	.60
54. Temp. detour	l. s.	1,000.00	1,200.00	700.00

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Large Mixer

This machine is stated to be one of the largest mixers ever installed in a central mixing plant. A Ransome 5 cu. yd. mixer designed and built by the Ransome Concrete Machinery Co. of Dunellen, N. J., it has been placed in operation by the Liberty Corporation of Philadelphia.

An outstanding feature is the pneumatically controlled discharge chute which is operated by a light turn of a small lever in the control room.

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Burst-Proof Hose

The B. F. Goodrich Co. of Akron, states that nothing can cause their burst-proof steam hose to burst except an external blow severe enough to cut the wire reinforcement. The hose is recommended for 200 lb. working pressure in all sizes with a safety factor of 15 to 1 in larger diameters and running up as high as 35 to 1 in small diameters.

The tube and the insulating layer are made of a special heat-resisting rubber compound which retains its liveliness and sealing properties even when subjected to high pressure steam. A high tensile steel wire reinforcement is applied in a braided form with openings large enough to permit the rubber to rivet itself, preventing any possibility of tube collapse. The form of wire tape used consists of 7 or 8 strands laid side by side. A braid of strong asbestos cord is placed between the wire braid and the cover, protecting the cover from burning, and the cover itself is a heavy long-wearing black rubber compounded with a special anti-oxidant to give it age-resisting qualities.

The hose is available in sizes ranging from $\frac{3}{8}$ in. to $2\frac{1}{2}$ in.

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Valve Line Redesigned

The Hancock Valve Division of Manning, Maxwell & Moore, Inc., of Bridgeport, has completely redesigned their line of Hancock bronze Flocontrol valves. The new line retains the basic proportional-flow characteristic of the original valve, and is now furnished with superhard stainless steel valve seats and discs of 500 Brinnell hardness.

The new valves have a body of the union bonnet type instead of the inside screw bonnet originally used.

USE A PUMP THAT
Goes Places
to save
Time and
Money
Weighs
93 pounds
complete
Pumps
15,000 gallons
per hour

If you want a light weight pump that you can get around quickly—set up in hard-to-reach locations—a Homelite is the pump for you. For a Homelite 3" pump weighs only 93 pounds complete with built-in gasoline engine—light enough for a man to carry. Yet it has the capacity to handle heavy jobs with money-saving speed—delivers 15,000 gallons of water per hour.

Furthermore it handles seepage and thick muddy water continuously—dependably. Primes itself—keeps water down to strainer level at all times—operates without manual attention. Guaranteed suction lift 28'. Air cooled gasoline engine starts quickly in any weather—won't flood, freeze, or overheat.

Get all the facts on this cost-saving unit. Drop the attached coupon in the mail today. No obligation.

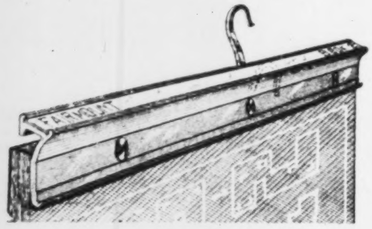
HOMELITE
CORPORATION
808 RIVERDALE AVENUE
PORT CHESTER, N. Y.

Gentlemen:
Please send me your bulletin giving complete facts on the 3" self-priming Homelite Pump—without obligation.

*Name*____________________
*Street*____________________
*City*__________*State*__________

Blueprint Binder

A new blueprint binder and hanger developed by the Wade Instrument Co. at Cleveland will hold as many as 75 blueprints or maps. It is made of duralumin with a steel center hook which can be turned down when it is desired to roll up the prints. Three telescoping binder screws with a metal strip at the back hold the prints firmly, eliminating tearing and falling out.



A renewable title strip sloped at a visible angle slides in a slot at the top of the hanger and is protected by a strip of celluloid. The hanger is regularly furnished in 18, 24 and 30-in. widths, but any size from 12 to 48 in. may be made to order.

Truck Mounted Striper

The Binks No. 37 road striping outfit, manufactured by the Binks Manufacturing Company of Chicago, can either be trailer mounted as shown or clamped to the running board, to run alongside the truck. This outfit lays a uniform even stripe at a speed of from 6 to 8 miles per hour.

A Binks automatic spray gun is mounted between two metal disks which insure a uniform stripe. The disks are adjustable from 4 to 6 in. in separation.

The striping outfit, complete with all accessories, is sold for $258.75 f.o.b.

NEW PUBLICATIONS

A Handy reference card containing recommended specifications for steel sheet piling and a list of suggestions to designers of sheet piling is put out by the Coast-to-Coast Steel Corp., of New York City.

Gas Engines operating on sewage sludge gas are described by the Worthington Pump & Machinery Corp. of Harrison, N. J. in their bulletin No. F-550-B13.

Long Range excavation is described in interesting job pictures and in specifications and descriptions of Sauerman power-drag and slack-line scrapers and slackline and tautline cableways in Catalog No. 18 of Sauerman Bros., Inc., of Chicago.

Earth Moving with Letourneau equipment is illustrated by a multitude of graphic photographs in "From Start to Finish," a publication of R. G. Letourneau, Inc., Peoria, Ill.

"Welding in Construction Work," a publication of the Lincoln Electric Co., of Cleveland, describes in considerable detail some of the many uses of welding to the construction man, varying from building pipe lines to strengthening old bridges.

A Catalog of Yeomans' heavy-duty bilge and sump pumps, Bulletin 3000, presents, in addition to specifications, considerable information and tables on the selection of the proper units.

Concrete Forms made of plywood are interestingly described in a new publication, "Technical Bulletin No. 4," of the Douglas Fir Plywood Association, of Tacoma, Wash. Considerable technical information and detail drawings are included.

A Catalog of standard gages for the measurement of rain, snow and water levels, covering an extensive line of instruments for research in the hydrologic cycle, has been issued by Julien P. Friez & Sons, Inc., of Baltimore.

The Economics of foundation exploration are examined in a leaflet "Will It Pay Us to Drill?", put out by the Standard Drilling Co., of New York City.

A Handsomely printed 35-page booklet describes in considerable detail the features of and the work done by Caterpillar elevating graders. The booklet, Form 4193, is put out by the Caterpillar Tractor Co., of Peoria, Ill.

Information on welded pipe lines is contained in a new booklet, "Building Better Pipe Lines," put out by The Lincoln Electric Co., of Cleveland. In addition to a multitude of job pictures, the booklet contains some instruction data and sample specifications.

Measuring Tapes and associated supplies for surveying and construction work are catalogued in a pocket size booklet, "Lufkin Tapes and Rules," put out by the Lufkin Rule Co. of Saginaw, Mich.

Spfcifications for placing reinforcing steel are put out by the Concrete Reinforcing Steel Institute, of Chicago under the title "Code of Standard Practice and Specifications for Placing Reinforcing Materials." These standards were first developed about ten years ago and formed portions of the Institute handbook "Reinforced Concrete," which is now out of print. They have recently been brought up to date and are now printed separately.

Directions for use and design specifications for Teco spike grid connectors for heavy wood construction are included in a leaflet issued by the Timber Engineering Co., of Washington, D. C.

A General Catalog of Colmonoy alloys and overlay metals has been issued by Colmonoy, Inc., of Los Nietos, Calif.

The Worthington line of single-cylinder, single-stage compressors is described in a condensed catalog of vertical compressors issued by the Worthington Pump and Machinery Corp., of Harrison, N. J.

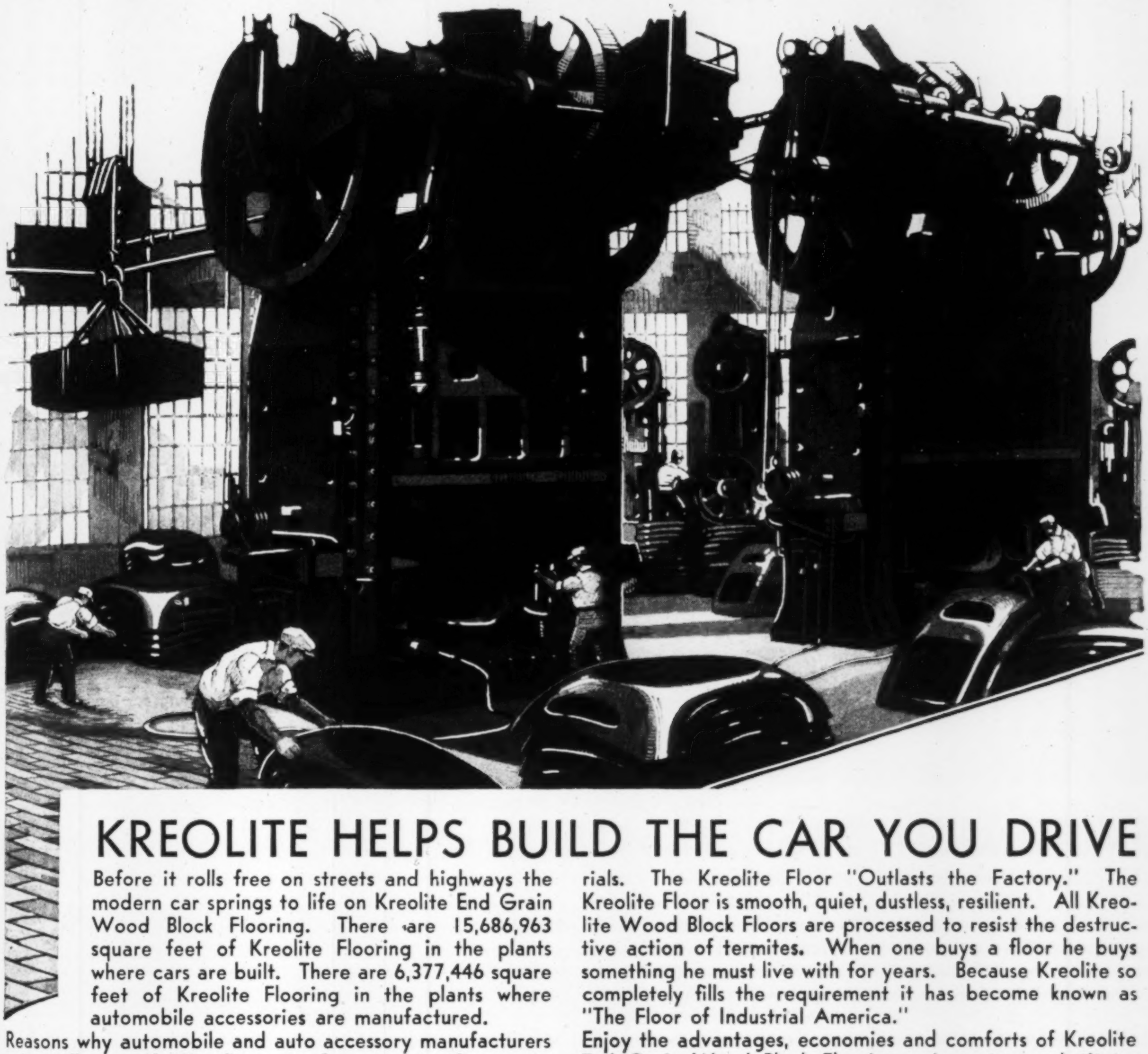
Elements contributing to the high speed operation of Euclid bottom dump Trac-Truk equipment are described in a substantial portfolio put out by the Euclid Road Machinery Co., of Cleveland.

Engineering data are included in the 114-page catalog of belt conveyors put out by the Chain Belt Co., of Milwaukee under the title "How to Handle It with Rex Belt Conveyors."

An Attractive booklet describing in non-technical language the advantages to be obtained from the use of Solvay calcium chloride on unpaved roads is issued by the Solvay Sales Corp. of New York City and entitled "High Service Low Cost Roads."

A Catalog of specialized paints and cleaning products for plant maintenance has been issued by the Skybryte Co., of Cleveland. An application chart shows the proper product for each type of surface and condition.

KREOLITE



KREOLITE HELPS BUILD THE CAR YOU DRIVE

Before it rolls free on streets and highways the modern car springs to life on Kreolite End Grain Wood Block Flooring. There are 15,686,963 square feet of Kreolite Flooring in the plants where cars are built. There are 6,377,446 square feet of Kreolite Flooring in the plants where automobile accessories are manufactured.

Reasons why automobile and auto accessory manufacturers universally specify Kreolite are of urgent significance to all other manufacturers. That is why there are over 100,000,000 square feet of Kreolite laid in manufacturing plants of all kinds in America.

Kreolite End Grain Wood Block Flooring is a time saver. It facilitates the movement of men, machines and materials. The Kreolite Floor "Outlasts the Factory." The Kreolite Floor is smooth, quiet, dustless, resilient. All Kreolite Wood Block Floors are processed to resist the destructive action of termites. When one buys a floor he buys something he must live with for years. Because Kreolite so completely fills the requirement it has become known as "The Floor of Industrial America."

Enjoy the advantages, economies and comforts of Kreolite End Grain Wood Block Flooring. Accept no substitute. Specify Kreolite. Insist on Kreolite.

THE JENNISON-WRIGHT COMPANY
TOLEDO, OHIO
BRANCHES IN ALL LARGE CITIES

FLOORS

WOOD BLOCK

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

SEWERS, TURNERS STATION, MD.

OWNER: Baltimore County Metropolitan District; S. A. Green, Chief Engineer.

PROJECT: Installation of 17,000 lin.ft. of 6 to 15-in. vitrified tile sewer pipe at Turners Station, Md.

BIDS: Five bids were opened June 28, 1937, ranging from a low of $51,704 to a high of $73,054, with completion scheduled for 90 days after award and all materials to be furnished by the contractor.

LOW BIDDERS:

1. A. S. Mundy Co., Inc., Woodbridge, N. J. . .	$51,704
2. Louis Aiello, Baltimore, Md.	52,393
3. Morocco Const. Co., Baltimore, Md.	64,801

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excav. and backfill for 15 in.	970 l. f.	$2.20	$4.50	$5.00
2. V. p. sewer, Cem. joints, 15 in.	970 l. f.	1.90	1.30	1.00
3. Excav. and backfill for 12 in.	890 l. f.	1.60	3.50	3.00
4. V. p. sewer, cem. joints, 12 in.	890 l. f.	1.32	.60	.72
5. Excav. and backfill for	770 l. f.	1.52	3.00	3.00
10 in.	770 l. f.	1.52	3.00	3.00
6. V. p. sewer, cem. joints, 10 in.	770 l. f.	1.32	.50	.60
7. Excav. and backfill for 8 in.	10,170 l. f.	1.20	1.50	2.60
8. V. p. sewer, cem. joints, 8 in.	10,170 l. f.	.80	.35	.44
9. Cl. B. c. i. p., 8 in.	l. s.	2,000.00	2,500.00	2,016.00
10. Excav. and backfill for house conn.	4,270 l. f.	.95	1.00	1.40
11. V. p. house conn., 6 in.	4,270 l. f.	.45	.30	.28
12. Y branch, v.p., 8 in.	193 each	1.90	1.00	1.20
13. Y branch, v. p., 10 in.	9 each	2.35	1.50	1.50
14. Y branch, v. p., 12 in.	23 each	2.73	2.00	2.00
15. Y branch, v. p., 15 in.	6 each	3.98	3.00	4.00
16. Brick m. h., 8 in., under 12 ft.	395 v. f.	11.00	10.00	10.00
17. Brick m. h., 8 in., over 12 ft.	14 v. f.	16.00	15.00	12.00
18. Manholes, over 4 ft.	8 l. f.	6.00	3.00	6.00
19. Type "A" drop conn., 12 in.	1 each	40.00	25.00	15.00
20. Type "A" drop conn., 8 in.	4 each	30.00	20.00	9.00
21. V. p. stubs, 8 in., in m. h.	2 each	2.00	1.00	2.00
22. Conc. cradle, Cl. "B"	120 c. y.	15.00	14.00	10.00
23. Conc. cradle, Cl. "C"	10 c. y.	12.00	13.00	9.00
24. Shoring, bracing	225 M.b.m.	20.00	20.00	20.00
25. Excav. rock	10 c. y.	1.00	10.00	7.00
26. Tile underdrain, 4 in.	5,000 l. f.	.15	.15	.15
27. Tile underdrain, 6 in.	2,000 l. f.	.25	.25	.25
28. Excav., refill below subgt.	50 c. y.	5.00	4.00	3.00
29. Excav., gravel refill	50 c. y.	9.00	7.00	3.00
30. Misc. excav., refill	25 c. y.	2.00	3.00	2.00
31. Replace conc. sidewalks	1,200 s. f.	.25	.18	.25
32. Conc. roads	20 s. y.	5.00	3.00	2.50
33. Macadam roads	220 s. y.	1.65	1.50	1.80
34. Perm. cinder roads	75 s. y.	1.00	1.00	.40
35. Type "A" drop conn., 15 in.	1 each	100.00	30.00	20.00

N. Y. SEWAGE DISPOSAL PLANT

OWNER: City of New York, Department of Sanitation; Deputy Commissioner, W. D. Binger in charge of engineering; R. H. Gould, engineer in charge of sewage disposal and interceptors.

PROJECT: Tallman's Island sewage disposal plant, located on mainland 1½ miles east of Flushing Bay on north shore of Long Island. Contract 2 for sedimentation, aeration and digestion tanks with appurtenant structures, and Contract 4 for gas-engine driven pumping units and blowers, as tabulated below, are two of eight contracts for complete new activated sludge treatment plant. Contract 1, $334,780, for bulkhead, pier and dredging a channel to deep water, has been completed by J. Rich Steers Co. The remaining contracts for pump and blower house, plumbing, heating, etc., are yet to be let.

CONDITIONS: Site is on Long Island Sound, accessible by land and water, and is of natural ground; probably one-fifth of excavation will be wet. Time limit for both contracts is one year. New York City union labor conditions will prevail.

BIDS: Seven proposals submitted for Contract 1, ranging from $1,303,063 to $1,708,609. Award made to low bidder on June 22, 1937. Only one bid received for Contract 4; award made to lone bidder June 22.

LOW BIDDERS: Contract 2.

1. North-Eastern Const. Co., New York City (contract)	$1,303.064
2. Rosoff Bros., Inc., Brooklyn, N. Y.	1,485.831
3. Turner Const. Co., New York City.	1,491.794
Contract 4: Worthington Pump & Mach. Corp., New York City (contract)	469.000

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Earth excav., above El. 0.0	75,000 c.y.	$0.39	$0.40	$0.35
2. Earth excav., below El. 0.0	19,000 c.y.	3.20	5.00	1.55
3. Earth excav., trench	16,700 c.y.	2.40	3.00	1.90
4. Remove, store topsoil	2,000 c.y.	.35	.50	.50
5. Redistribute topsoil	4,000 c.y.	.70	.40	.50
6. Rock excav.	500 c.y.	9.00	3.00	8.40
7. Timber sheeting, left in place	110 M.b.m.	23.00	30.00	30.00
8. Portland cement	36,000 bbl.	2.20	2.50	3.10
9. Concrete, class A	24,200 c.y.	14.30	16.50	14.85
10. Concrete, class B	800 c.y.	4.80	15.00	8.05
11. Rubbed finish	82,000 s.f.	.08	.08	.16
12. Concrete floor hardener	30,000 s.f.	.02	.02	.03
13. Waterproofing concrete	34,000 s.f.	.025	.10	.055
14. Reinf. steel	3,500,000 lb.	.055	.0575	.05
15. C. I. pipe, b. & s.	1,420,000 lb.	.0512	.07	.09
16. C. I. pipe fittings, b. & s.	140,000 lb.	.098	.07	.145
17. C. I. pipe specials, b. & s.	70,060 lb.	.132	.20	.185
18. C. I. pipe flanged, 6–12 ft. lgths.	80,000 lb.	.061	.15	.105
19. C. I. pipe flanged, 3–6 ft. lgths	20,000 lb.	.072	.15	.12
20. C. I. pipe flanged, 1–3 ft. lgths	20,000 lb.	.104	.25	.16
21. C. I. pipe fittings, flanged	60,000 lb.	.103	.25	.16
22. C. I. pipe specials, flanged	10,000 lb.	.151	.50	.30
23. Pipe expansion couplings	29,000 lb.	.126	.20	.35
24. Flexible connections	L. S.	790.00	1,000.00	1,540.00
25. Ground water relief valves	144 ea.	75.00	100.00	54.00
26. Valves and sluice gates	L. S.	35,775.00	39,000.00	57,600.00
27. Venturi meters, registers	L. S.	27,820.00	40,000.00	45,000.00
28. Stop planks and baffles	15,000 f.b.m.	.14	.20	.155
29. Misc. wrought iron, plain	140,000 lb.	.18	.13	.185
30. Misc. wrought iron, galv.	11,000 lb.	.22	.17	.225
31. Misc. wrought aluminum	17,000 lb.	.90	.90	.90
32. Misc. wrought bronze	600 lb.	1.50	.55	1.50
33. Misc. iron castings, plain	31,000 lb.	.17	.08	.125
34. Misc. iron castings, galv.	1,000 lb.	.20	.12	.30
35. Misc. aluminum castings	200 lb.	2.00	2.00	2.10
36. Misc. bronze castings	200 lb.	1.25	2.00	1.55
37. Copper exp. joint	8,000 lb.	.45	.30	.39
38. Sheet exp. joint, ½ in.	4,000 s.f.	.40	.28	.46
39. Sheet exp. joint, ¾ in.	10,000 s.f.	.41	.38	.59
40. Structural steel	60,000 lb.	.063	.06	.085
41. Precast conc. diffuser pl. boxes, 18-plate	286 ea.	75.00	60.00	82.00
42. Ditto, 10-plate	31 ea.	40.00	30.00	44.00
43. Ditto, 8-plate	20 ea.	35.00	28.50	44.00
44. Precast conc. filler blocks	3,000 l.f.	1.60	1.00	1.35
45. Precast conc. walk slabs	10,600 s.f.	.65	.36	.55
46. Diffuser plates	5,600 ea.	2.35	1.75	3.60
47. Floor, roof drain system	L. S.	5,400.00	6,000.00	4,200.00
48. Sludge, sump and lime pumps	L. S.	12,700.00	15,000.00	15,800.00
49. Air lifts	L. S.	6,100.00	5,600.00	7,450.00
50. Sludge, scum removal mech.	L. S.	91,825.00	97,550.00	132,000.00
51. Dry chemical feed mech.	L. S.	4,100.00	2,800.00	3,750.00
52. Chlorinators	L. S.	11,800.00	12,000.00	13,000.00
53. Instal sludge thickener mech.	L. S.	480.00	900.00	630.00
54. Instal digester tank covers	L. S.	28,500.00	23,000.00	35,300.00
55. Hydrants	12 ea.	85.00	100.00	155.00
56. Elec. conduits, steel	15,000 l.f.	.37	.33	.46
57. Elec. conduits, copper	1,500 l.f.	1.25	1.10	1.10
58. Elec. conduits exp. joint	400 ea.	3.00	2.65	1.90
59. Elec. conduit motor conn.	L. S.	850.00	750.00	1,180.00
60. Floor grating, 1 in.	3,600 s.f.	1.30	1.30	1.65
61. Floor grating, 1¼ in.	1,560 s.f.	1.60	1.50	1.95
62. Floor grating, 1½ in.	200 s.f.	1.80	1.75	2.25
63. Rails for tanks	8,000 l.f.	.40	.35	.32
64. Gravel or broken stone	100 c.y.	3.00	3.00	4.20
65. Concrete piles	6,000 l.f.	2.50	2.25	3.00
66. Vit. pipe drain, 30 in.	825 l.f.	10.75	10.00	11.10
67. Vit. pipe drain, 24 in.	810 l.f.	4.80	8.00	4.60
68. Vit. pipe drain, 20 in.	150 l.f.	2.60	7.00	6.00
69. Vit. pipe drain, 15 in.	140 l.f.	1.70	5.00	4.55
70. Vit. pipe drain, 4 in.	150 l.f.	.70	.50	.70
71. Manholes	L. S.	5,100.00	3,500.00	6,550.00
72. Reinf. conc. effluent pipe	700 l.f.	16.25	30.00	19.00

(Additional Contract Unit Prices on second following page)

(Contract Unit Prices continued from page 370)

BRIDGE AND OVERPASS, OKLA.

OWNER: Oklahoma State Highway Dept., V. T. Moon, Chief Engineer.

PROJECT: Combined bridge over South Canadian River and overpass across A. T. & S.F.R.R., Purcell, Okla. Project consists of 33 deck truss spans 100 ft. long, one 200-ft. deck truss span, two 50-ft. I-beam spans, all on concrete piers; total length of project 3,672 ft. Carries 32-ft. roadway and two 3-ft. sidewalks. Bridge is federal aid project; overpass, 509 ft. long near one end is WPGM project. For accounting purposes separate bids were asked for on each part of project; for most part contractors bid same unit prices on each.

BIDS: Nine bids were received in May, 1937, based on six alternate designs. Lowest was for Design No. 2, $651,781; highest for this design was $712,931. Highest of all was Design No. 4; top bid was $770,856. Rock excavation is a separate bid unit; all other excavation, sheeting and shoring is included in the price bid for foundation concrete.

CONDITIONS: Quicksand in river expected to give trouble in foundations of river bridge. Existing bridge will be kept in service for traffic. Completion scheduled for eight months. Minimum wage rates specified: Skilled, $1.00; semi-skilled, 75c.; common, 40c. Material haul will be about one mile.

LOW BIDDERS: (Three low for Design No. 2 only).

1. Guy H. James, Oklahoma City, Okla. (contract)	$651,781
2. Kelliher Const. Co., Dallas, Tex.	654,236
3. Leo Saunders, Oklahoma City	657,468

Item	Quan	Unit Prices (1)	(2)	(3)
1. Rock excav.— Overpass	256 c. y.	$10.00	$5.50	$12.00
Bridge	1,825 c. y.	10.00	8.00	12.00
2. Concrete piles	930 l. f.	3.00	3.50	3.50
3. Concrete, fdns. of abut. and piers — Overpass	614 c. y.	27.00	27.90	35.75
Concrete, fnds. of abut. and piers — Bridge	5,676 c. y.	27.00	27.20	35.75
4. Concrete, abut. and pier shafts	3,117 c. y.	17.00	17.50	12.50
5. Concrete, deck slab	4,049 c. y.	15.00	16.96	15.50
6. Reinforcing steel	1,104,690 lb.	.047	.0522	.0425
7. Structural steel, carbon	3,063,100 lb.	.061	.05925	.05
8. Struct. steel, manganese	1,105,500 lb.	.072	.06325	.0683
9. Lead bearing plates	3,720 lb.	.15	.15	.11
10. Hand rail	7,346 l. f.	3.50	4.16	3.50

Note: Except for Items 1 and 3, all quantities are for combined bridge and overpass for which unit prices are identical.

HIGHWAY UNDERPASS, NO. DAK.

OWNER: State Highway Dept., Fargo, N. D.; Clifford Johnson, engineer.

PROJECT: Reconstruction of Tenth St. underpass at N.P.R.R. crossing in Fargo, N. D., including the removal of existing timber structures and the construction of steel and concrete structure with 32 ft. roadway and 2 sidewalks under 9 tracks and part of freight house and platforms, and the removing of present concrete deck and centre pier under Front St. and replacing them with single steel and concrete span on old abutments.

BIDS: Five bids were opened and contract awarded June 1937. The bids ranged from the contract low of $257,983 to a high of $314,312, with minimum hourly wages stipulated of 80c. for skilled and 50c. for common labor, and completion scheduled for 250 working days after award.

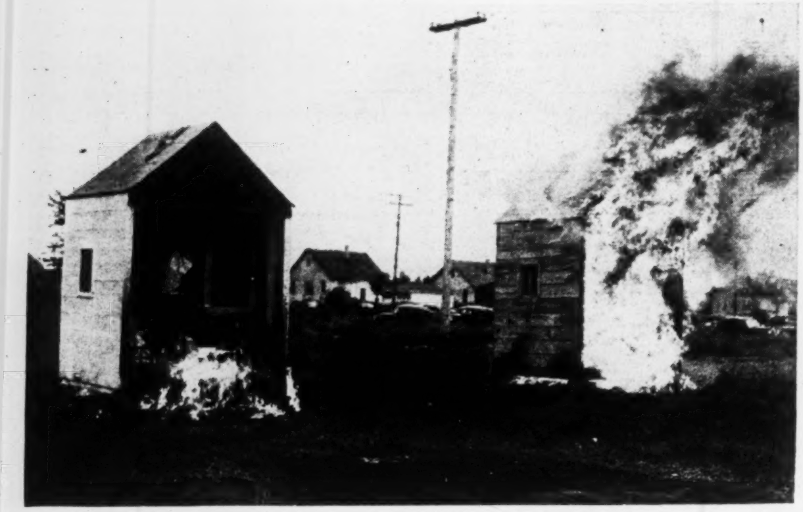
LOW BIDDERS:

1. A. Guthrie Co., Inc., Minneapolis, Minn. (contract)	$257,983
2. Industrial Contracting Co. & A. A. Prendergast, Minneapolis, Minn.	264,670
3. Rue Construction Co., Bismarck, N. D.	264,995

Item	Quan.	Unit Prices (1)	(2)	(3)
I — Paving, Incidental Items, West Approach				
1. Relay paving brick	452 s. y.	$2.00	$1.45	$1.60
2. Conc. shim	34.5 c. y.	15.00	16.50	25.00
3. Install conc. paving	4.1 s. y.	3.50	4.00	3.20
4. Remove conc. paving	6.7 s. y.	1.00	3.00	.70
5. Remove conc. curb	116.6 l. f.	.25	1.25	.40
6. Remove conc. header	35.0 l. f.	.25	.20	.30
7. Remove conc. curb	30.5 l. f.	.25	.30	.30
8. Adjust m.h. castings	1 no.	25.00	17.50	20.00
9. Remove brick paving	452 s. y.	1.00	.55	.50
10. Remove conc. sidewalk	39.0 s. f.	.05	.15	.10
11. Install conc. sidewalk	39.0 s. f.	.20	.21	.25
12. Install conc. curb, gutter	46.5 l. f.	.95	1.30	1.10
13. Install c.c. str. type 1	27.5 l. f.	1.05	1.70	1.60
14. Install c.c. curved type	3.0 l. f.	1.05	1.70	1.70
15. Install c.c. str. type 6	44.2 l. f.	1.15	1.45	1.25
16. Install c.c. curved type 6	25.9 l. f.	1.15	1.45	1.35
II — Paving, Incidental Items, East Approach				
17. Relay paving brick	445 s. y.	2.00	1.45	1.60
18. Conc. shim	33.5 c. y.	15.00	16.50	25.00
19. Adjust water valves	2 no.	25.00	14.50	25.00
20. Adjust catch basins	2 no.	25.00	17.50	20.00
21. Remove brick paving	445 s. y.	1.00	0.55	0.50
22. Remove conc. base	55.9 s. y.	1.00	1.00	.50
23. Install conc. base, 7 in	55.9 s. y.	3.50	2.50	2.00
24. Remove gran. block paving	129.9 s. y.	1.00	.75	.60
25. Relay gran. block paving	129.9 s. y.	2.00	2.00	1.75
III — Roadway Items				
26. Excav. unclass	782 c. y.	1.50	.75	1.10
27. Spec. curb inlets	6 ea.	35.00	72.00	80.00
28. Sand, gravel fill	1,257 c. y.	1.50	1.80	2.50
29. New sump, sump pump	1 l. s.	3,800.00	5,850.00	5,000.00
30. Manhole, sump	4 ea.	100.00	235.00	100.00
31. Reinf. conc. manhole	1 ea.	170.00	260.00	300.00
32. Curb inlets	2 ea.	30.00	75.00	75.00
33. V. p. drains, 8 in	1,120 l. f.	1.40	1.25	1.10
34. V. p. drains, 10 in	360 l. f.	1.55	.75	1.30
35. V. p. drains, 12 in	401 l. f.	1.75	2.55	2.00
36. C. i. p. drains, 8 in	203.5 l. f.	2.60	4.15	3.00
37. C. i. p. drains, 12 in	24 l. f.	3.70	6.00	5.00
38. Water pipe protection	1 ea.	200.00	705.00	300.0[illegible]
39. Conc. curb, str. type 1	116.2 l. f.	1.05	1.70	1.70
40. Conc. curb, curved type 1	366.1 l. f.	1.05	1.70	1.80
41. Conc. curb, str. type 2	174.8 l. f.	2.30	2.45	3.20
42. Conc. curb, gutter, str. type 4	20.2 l. f.	2.40	4.60	5.00
43. Conc. curb, gutter, str. type 5	360.6 l. f.	1.80	2.10	2.50
44. Conc. Cl. "A"	37.8 c. y.	20.00	28.15	20.00
45. Reinf. steel	1,585 lb.	.05	.058	.05
46. Install conc. sidewalk	10,840.8 s. f.	.20	.21	.25
47. Install reinf. conc. paving	1,040.3 s. y.	3.50	3.30	3.30
48. Fill old sump	1 ea.	100.00	125.00	250.00
49. Remove conc. retaining wall	203.8 l. f.	1.00	.60	1.00
50. Remove conc. sidewalk	635 s. f.	.10	.15	.10
51. Remove conc. curb	1,232.8 l. f.	.15	.30	.40
52. Remove spec. center curb	170 l. f.	.15	1.95	2.00
53. Remove conc. tile sidewalk	12,039 s. f.	.10	.0325	.10
54. Remove conc. paving	672 s. y.	1.00	3.00	1.00
55. Remove brick paving	920 s. y.	1.00	.55	.60
56. Remove reinf. conc. base	393 s. y.	1.50	3.00	.50
57. Remove catch basin	8 ea.	10.00	11.75	20.00
58. Remove manholes	2 ea.	10.00	30.00	20.00
59. Vit. pipe drains, 6 in	222 l. f.	.50	.60	.75
IV — Structural Items				
60. Temp. bridge work	l. s.	18,500.00	12,540.00	13,500.00
61. Remove, dispose timber struct	l. s.	4,500.00	6,700.00	1,500.00
62. Changes to fr't house platforms	l. s.	1,000.00	4,075.00	2,000.00
63. Remove conc. center pier, deck	l. s.	4,000.00	7,700.00	9,000.00
64. Excav. dry struct	5,082 c. y.	1.25	2.05	1.00
65. Furn. treated timber piling	19,680 l. f.	1.00	1.05	1.40
66. Drive treated tim. piling	19,680 l. f.	.15	.10	.05
67. Conc. Cl. A., abutments	1,255.5 c. y.	23.50	22.80	22.00
68. Conc. Cl. A., slabs	297.8 c. y.	20.30	23.50	26.00
69. Conc. Cl. A., retain'g wall	1,385.3 c. y.	21.25	18.40	16.00
70. Conc. crib. walls	1,376 s. f.	1.75	1.25	1.50
71. Struct. steel	602,000 lb.	.05	.057	.06
72. Spec. ballast plates	46,100 lb.	.086	.095	.07
73. Comp. steel, conc. deck slabs	3,060 s. f.	1.25	1.45	1.20
74. Zinc plate, 22 gauge	538 s. f.	.35	.95	1.20
75. G.i.p., 5 in diam, 22 gauge	64 l. f.	.50	.75	2.00
76. Waterproof membrane, 3 ply	1,632 l. f.	.30	.44	.45
77. Asphalt waterproof, 1 coat	2,295 s. f.	.04	.05	.05
78. Asphalt w.p. 2 coats	15,873 s. f.	.05	.07	.08
79. W.p. membrane, two ply	9,915 s. f.	.20	.12	.25
80. Asphalt plank	9,915 s. f.	.20	.29	.25
81. Pipe railings	177 l. f.	1.00	1.50	1.20
82. 3 bar pipe railing	334.5 l. f.	2.25	2.75	2.20
83. 2 bar pipe railing	1,610.75 l. f.	1.20	1.85	1.3[illegible]
84. Ornamental railing	570 l. f.	6.75	7.10	6.20
85. Lighting system	1 ea.	2,500.00	1,245.00	900.00
86. Conc. Cl. B	2,199.1 c. y.	15.50	12.45	16.00
87. Reinforcing steel	367,544 lb.	.05	.049	.055

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Fire Proofing Compound Tested

A fire-proofing compound, manufactured by the United States Flameproof Manufacturing Co., was publicly tested this month in Detroit, when two model wooden buildings, one untreated and one in which the building itself and the furniture it contained had been treated with the Flame-proof compound were set on fire. The picture shows the two buildings 45 seconds after the fire had been started.

The United States Flameproof Manufacturing Corporation is the licensee of a German process which will flameproof the exterior of buildings as well as the interior and any textiles.

Steel Climbers

A new climber manufactured by the Service Supply Corporation of Philadelphia is said to enable a workman to climb steel as easily as walking upstairs and to provide a safe grip regardless of the angle of contact. Built of a special steel, these climbers are light in weight.

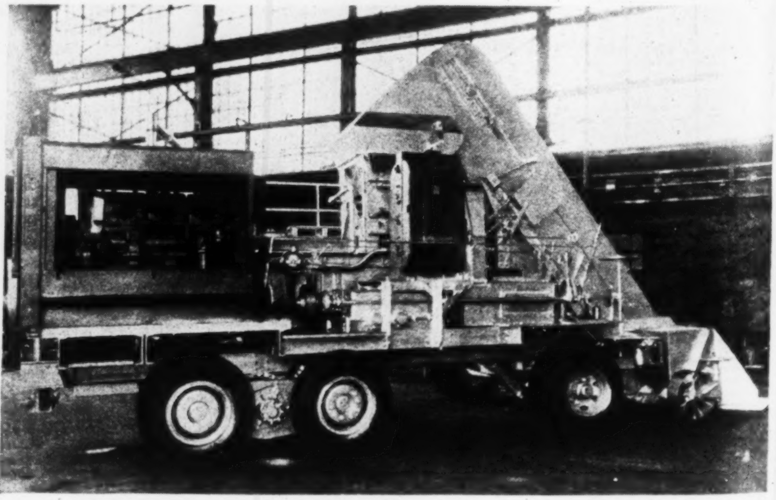
Savings in painting costs are claimed from the use of these climbers, due to the fact that the members which engage the steel have a cushioned contact which prevents scratching paint.

EQUIPMENT IN BRIEF

A WELDER unit mounted on a regulation farm tractor is being distributed by the Southern California Tractor Co. of Los Angeles. The generator is a standard model 200-amp. unit of the Lincoln Electric Co. of Cleveland.

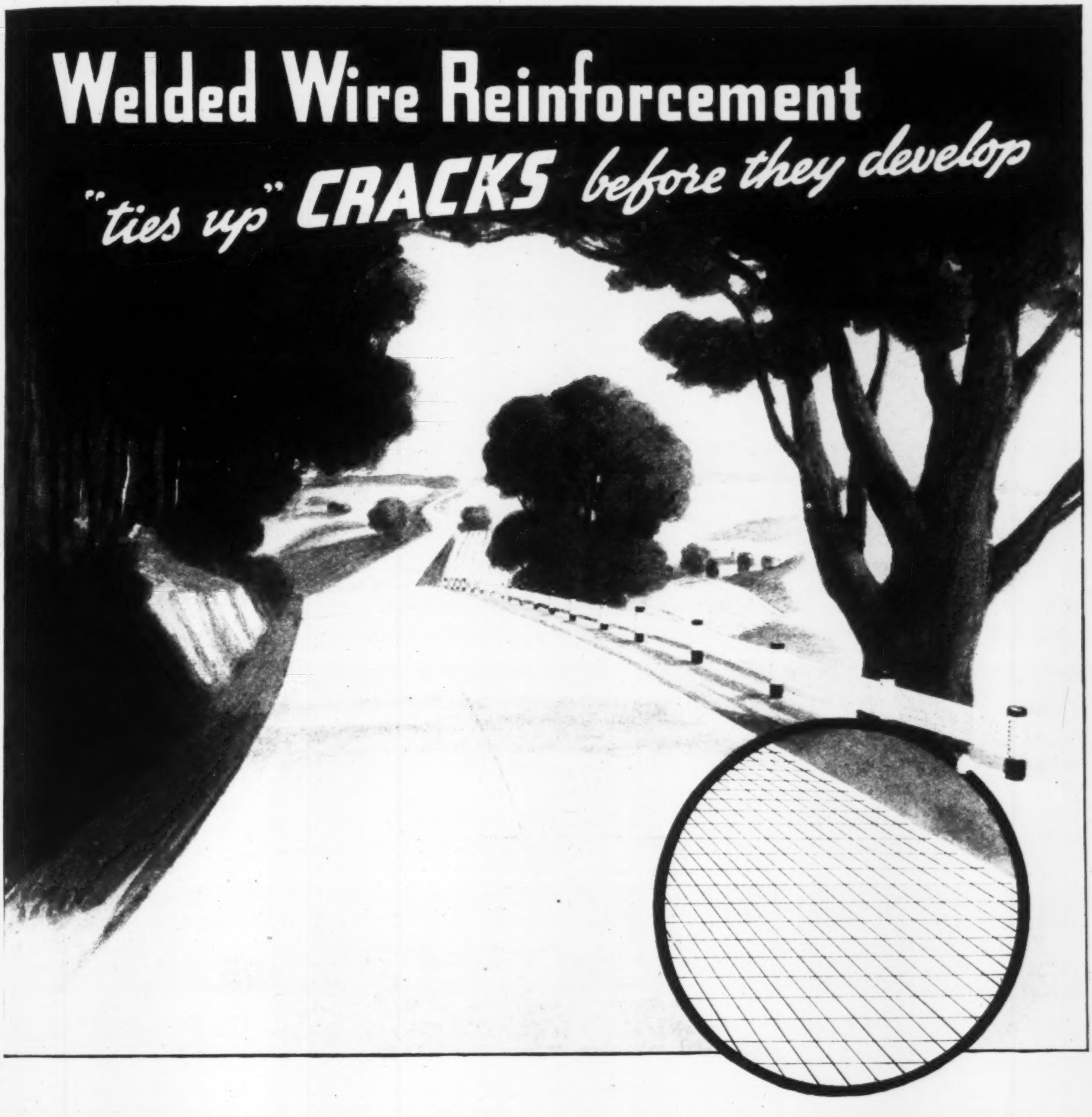
WIRE CABLE can be cut, it is said, with three raps of an 8-lb. sledge on the new Starrett cable cutter. The cable cutter is a specially designed cold chisel, mounted in a supporting frame and having a peculiarly shaped cutting edge which retains the natural shape and lay of the strands. The cable cutter is sold by Montgomery & Company, Inc., of New York City.

A PULL SHOVEL attachment for the Koehring 251 shovel has been developed by the Koehring Co. of Milwaukee. Features claimed by the manufacturer are maximum strength combined with elimination of weight at the digging end arising from the welded construction of the attachment, a long and deep digging range, high dumping lift and easy dumping.



Diesel-Powered Asphalt Mixer

An asphalt mixer powered with a Buda diesel engine is manufactured by the Iowa Manufacturing Co., of Cedar Rapids, Iowa. The plant has a 1,000-gal. supply tank equipped with kerosene pressure burners for maintaining even temperatures in the bitumen and in the tank during operation. The aggregate batcher is synchronized with the asphaltic material-measuring pump to insure uniform mixture. The machine is powered with a Buda diesel engine, Model 6-LD-909, with 909 cu. in. displacement.


Welded Wire Reinforcement
"ties up" CRACKS before they develop

The road reinforced with Pittsburgh Welded Wire Reinforcing is a long jump ahead of trouble from the very day the concrete is laid. Disintegration is forestalled or retarded through the effective control of cracking. This is achieved by the manner in which incipient cracks are "tied-up" by the electrically welded, uniformly spaced members of the fabric. Greatly lowered maintenance costs reported by state highway departments on welded wire reinforced roads, as compared with plain concrete highways, prove the economy of the use of "Pittsburgh" Reinforcing. • For information and technical data on the use of Pittsburgh Welded Wire Reinforcing, write Pittsburgh Steel Company, 1644 Grant Building, Pittsburgh, Pa. • Manufacturers of Pittsburgh Safety Highway Guard (also shown above) and Pittsburgh National Reinforcing.

Pittsburgh NATIONAL Reinforcing

Ornamental Luminaire

The Reflectolux Senior is an ornamental luminaire designed for 300- to 500-watt lamps on multiple circuits or 4,000 to 15,000 lumen lamps on series circuits and manufactured by the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

The canopy is of cast iron and locked to the suspension fitting by a set screw. Four bayonet pins are located inside the canopy to engage the bayonet slots of the case, and a locking screw in the lower section of the canopy provides a positive lock with the case, which is spun from heavy gage copper sheet.

The body is a cast aluminum housing that incloses the reflector. The reflector is of Alclad aluminum sheet treated by the Alzak process.

The finish of all exterior metal parts is green baked enamel.

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Fire Line Valve

An inexpensive and easily installed valve designed to check the amount of flow through fire lines has been developed by Northrop & Cook Co. of New York City. The meter is also recommended for measurement of water drawn from city hydrants, for installation on the effluent of each unit at a filter plant, measurement of wash water at filter plants, and similar uses.

The meter consists simply of a propeller unit which is extended into the pipeline and a counting and registering device. Installation on a fire line requires only a 2-in. tap and a gate box. The tap is made on the top of the pipe, the Flow-OM-eter is set, and a gate box placed over it. The Flow-OM-eter is read by removing the lid of the gate box and lifting the Flow-OM-eter cover with a wire hook.

Prices of the Flow-OM-eter in different sizes and types cover a range from $100 to $160.

MANUFACTURERS' ACTIVITIES

Davey Compressor Co., Kent, Ohio, began last month the publication of a monthly house organ called "The Davey Diary."

The Revolution Counter business of the Belden Mfg. Co. has been bought by the Ideal Commutator Dresser Co. of Sycamore, Ill., who will market and manufacture the product hereafter at Sycamore.

The West Coast Lumbermen's Association has opened a Los Angeles office.

Richmond Screw Anchor Co. of Brooklyn, N. Y., has announced its association with Superior Concrete Accessories, Inc., of Chicago, in manufacturing and selling form-tying devices and accessories for concrete construction.

Ceco Steel Products Corp. is the new name of the Concrete Engineering Co. of Omaha. Expansion of the services and products of the organization, it was stated, made it necessary to adopt a name which would be more descriptive. There will be no change in management or personnel.

A New Product Division has been created by the Westinghouse Electric & Mfg. Co. This division, responsible for the development of lines of activity which are new either to the art or to the company, will include separate engineering, manufacturing and sales departments. The new department will be in charge of H. M. Wilcox.

The Universal Crane Co., formerly a subsidiary of The Thew Shovel Co., has been merged with the parent company. Manufacturing facilities and operations of both companies have been consolidated for several years, and the present merger is in the interests of simplifying marketing operations. Universal products will be identified as coming from the Universal Crane Division of Thew Shovel Co. Products of both organizations have been marketed under the common trade name "Lorain" for the past several years.

The Chemical, steel, and cement business of African Metals Corp. have been taken over by a newly formed corporation, Industrial Sales Corp. African Metals Corp. states that no change has taken place in its financial control and management and that the new corporation will operate under the same auspices.

Pangborn Corp. of Hagerstown, Md., which recently took over the dust collecting interests of the Blaw Knox Co. of Pittsburgh, has announced that M. I. Dorfan, former manager of the Blaw Knox dust division, has been re-employed by the Pangborn Corp. to act as general field representative under the title of dust control specialist.

B. C. Heacock, president of the Caterpillar Tractor Co. of Peoria, Ill., was recently elected a member of the board of directors of the U. S. Chamber of Commerce.

New Distributors

Republic Steel Corp. of Cleveland has appointed the following new distributors who will handle Republic's complete range of tubular products, including steel merchant pipe and Toncan Iron pipe: Bluefield Supply Co., Bluefield, W. Va.; Ormand Plumbing Supply Co., San Antonio; J. Gaber Co., Houston; and Morgan's, Inc., Savannah, Ga.

Recent Appointments of distributors by the Ransome Concrete Machinery Co., Dunellen, N. J., include: Manufacturers Supply Co., Pensacola, Fla.; Meriwether Supply Corp., Shreveport, La.; Smoot Machinery Co., Salt Lake City; Mine & Smelter Supply Co., El Paso; and Dominion Distributors Co., St. John's, Newfoundland.

The Toledo Area will be covered for the General Refractories Co. by the Hull Industrial Supply Co. of Toledo. The distributor in the Dayton area will be the M. D. Larkin Co. of Dayton.

Bethlehem Fabricators, Inc., Bethlehem, Pa., have appointed Waghorne-Brown Co., Boston, as their representatives in the states of Maine, New Hampshire, and Vermont, and in central and eastern Massachusetts.

Personnel Changes

The Sullivan Machinery Co. has announced the appointment of Gail E. Spain, formerly assistant sales manager of Caterpillar Tractor Co., as general manager of the rock handling division. Mr. Spain will be in charge of domestic sales of drills, air compressors, and hoists and will also be responsible for manufacturing and engineering.

R. L. Morrison has been appointed general manager of the Bendix-Westinghouse Automotive Air Brake Co. at Pittsburgh to succeed the late Robert M. Heinrichs. Mr. Morrison formerly was the district manager for Bendix-Westinghouse at Detroit.

BLAW·KNOX *in the front line of 1937 construction*

CONCRETE BUCKETS
CLAMSHELL BUCKETS
BOTTOMLESS SCRAPERS
BULK CEMENT PLANTS
TRUCK MIXERS
ROAD FINISHING MACHINES
SHEEPS-FOOT TAMPING ROLLERS
STEEL STREET FORMS
BATCHER-PLANTS
STEEL FORMS *for General Concrete Construction*
NEW ROAD FORMS

The *choice of experience* is an intelligent guide to equipment buying.

—for thirty years the design of Blaw-Knox Road Building Equipment has progressed with the industry to produce more efficient and time saving equipment.

It is new—better—always improved to meet the peak demands of modern road building.

—for 1937, join with Blaw-Knox in the front line of construction.

BLAW-KNOX COMPANY
2001 Farmer's Bank Building • Pittsburgh, Pa.
Offices and Representatives in Principal Cities

(Continued from page 408)

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS ¾-in. billet *b*	RIVETS ¾-in. structural	WIRE NAILS Base	SHEET PILING Base	STEEL RAILS Per Gross Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle bars	Std. spikes *c*	Tie plates *c*	[illegible]
Birmingham	$2.40	$2.60	$3.70	$2.55	....	$42.50	$43.00	$42.00	$2.80	$3.15	$2.30	$4.35
Chicago	2.30	2.60	3.70	2.80	$2.70	42.50	43.00	42.00	2.80	3.15	2.30	[illegible]
Pittsburgh	2.25	2.55	3.60	2.75*d*	2.60	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Buffalo	2.35	2.60	....	....	....	....	....	....	....	....	2.30	
Cleveland	2.435‡	2.60	....	....	....	....	....	....	....	....	....	
Youngstown	....	2.60	....	....	....	....	....	....	....	3.15	....	
Gulf ports	2.65a	2.95a	....	....	3.05a	....	....	....	....	....	....	
Pacific ports	2.80a	2.95a	....	....	3.05a	....	....	....	....	3.15	2.40	

‡ Delivered. *a* F.o.b. cars dock. *b* For rail steel deduct 15c. from billet prices. *c* Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., on spikes alone, Lebanon, Pa., Richmond, Va. *d* Add switching charge $18 per c.l.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb., base price	REINFORCING BARS Per 100 lb., ¾ in., base price 15 tons or over *b* New billet	Rail steel	Add $/cwt. for Switch	Del.	EXPANDED METAL LATH Per 100 sq.yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 s.f., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires Per sq. yd.	SHEET PILING Per 100 lb base price
Atlanta	$3.65	$2.82	$2.67	.02½	.10	$21.00	$23.00	$1.75	$1.31	$0.1692	$2.60
Baltimore	3.60	2.82	2.67	....	.10	21.00	23.00	1.62	1.22	.1566	2.95
Birmingham	2.40*a*	2.60	2.45	.02½	.10	22.50	24.50	....	....	.....	
Boston	4.07	3.03	2.88	$20 C.L.	.10	21.60‡	23.60‡	1.68	1.26	.1620	3.02
Chicago	2.30*a*	2.60	2.45	.03	.05	23.00	25.00	1.61	1.22	.1557	2.70
Cincinnati	3.95	2.815*c*	2.665*c*	....	.05	25.01	29.50	1.60	1.21	.1548	
Cleveland	3.86	2.60	2.45	.02½	.10	22.50	22.50	1.59	1.20	.153	
Dallas	2.45	3.335	3.185	....	....	.....	.....	1.86	1.28	.1791	2.85
Denver	4.48	4.00	3.85	....	....	23.50	25.50	1.87	1.38	.1809	
Detroit	3.95‡	2.70	2.55	....	.10	22.50	24.50	1.62	1.22	.1566	2.865
Kansas City	4.24	3.02*c*	2.87*c*	.0	.05	20.50	22.50	1.82	1.29	.1665	3.12
Los Angeles	3.825	2.90	2.75	.02½	.05	23.00	27.50	1.89	1.40	.1827	3.90
Minneapolis	4.00‡	2.90*c*	2.75*c*	.0	.10	26.00	30.00	1.71	1.28	.1656	3.00*d*
Montreal	2.90	2.40	2.40	....	....	32.50	32.50	2.46	1.82	.253	3.50
New Orleans	....	2.94	2.79	.05	.10	21.00	23.00	1.76	1.31	.1701	
New York	3.97	2.88	2.73	....	.10	21.50	23.00	1.67	1.26	.1584	2.91
Philadelphia	3.90	2.84	2.69	....	....	22.50	24.50	1.63	1.23	.1575	2.89
Pittsburgh	2.25*a*	2.55	2.40	.02½	.10	20.00	22.00	1.55	1.18	.1494	2.60
St. Louis	3.99	2.87	2.72	.0	.05	23.00	25.00/27.00	1.62	1.21	.1566	2.97
San Francisco	3.95	2.95	2.80	.02½	.10	24.50	26.50	1.89	1.39	.1827	3.15
Seattle	3.10	2.95	....	....	....	25.50	27.50	1.89	1.39	.1827	3.05

‡ Delivered. *a* Mill prices. *b* 5-15 tons, add 15c. 1-5 tons, add 25c. Less than 1 ton, add 50c. *c* 20 tons or over Base. *d* Mill price plus freight.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in. *a*	VITRIFIED SEWER PIPE Per foot, delivered, 8 in., s.s.	12 in., s.s.	ASTM C13–35 24 in., d.s.	36 in., d.s.	CLAY DRAIN TILE Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTM C 14–35 12 in.	24 in.	WROUGHT STEEL PIPE Full standard weight. *h* 1 to 3 in., Butt Weld Black %	Galv. %	3½ to 6 in., Lap Weld Black %	Galv. %
Atlanta	$50.00	$0.26*bc*	$0.468*bc*	$1.69	$4.50*c*	$85.00	$128.00	$0.45	$1.625	44.5	35.5	42	32.0
Baltimore	53.50	.28	.54	2.38	6.75	110.00	170.00	.40	1.60	....	....	....	....
Birmingham	46.00	.25	.45	1.625	4.66	85.00	220.00	.40	1.60	64.5	55.5	62	52.5
Boston	53.50	.224	.432	1.98	5.8425	99.00	153.00	.45	2.50	....	....	....	....
Chicago	54.50	.28	.54	2.25	6.25	100.00‡	150.00‡	.38	1.48	52.5	41.25	50.625	37.5
Cincinnati	53.00	.217	.4185	1.80	5.2275	75.00	120.00	.80	2.20	52.6875	41.4375	49.5625	37.6875
Cleveland	54.50	.175	.375	1.44	4.305	69.00	108.00	.35	1.75	56	44.5	51.5	40.5
Dallas	58.00	.40	....	....	....	160.00	260.00	.46	1.57	69.5	61.5	67	58.5
Denver	66.00	.29†	.50†	2.10†	....	130.00	220.00	....	....	44	33	41	29
Detroit	52.40	.203	.3915	1.71	5.2375	76.50	130.00	.33	1.50	53.2	41.9	50.1	37.8
Kansas City	56.00	.30	.54	2.16	5.00	120.00	240.00	.45	1.60	49	37.6	45.8	34.
Los Angeles	54.50	.282†	.508†	2.034†	5.085†	115.50	192.50	1.00	2.00	57.1	48.1	54.6	44.6
Minneapolis	57.00	.24†	.432†	1.728†	4.60†	......	......	.65	1.75	....	....	....	....
Montreal	55.00	.33†*e*	.59†*e*	2.04†*e*	....	82.00	134.00	.51	2.04	....	....	....	....
New Orleans	52.00	.26	.468	1.69	....	150.00	220.00	.45	1.65	....	....	....	....
New York	53.00	.28	.58	2.45	6.30	......	......	.50	1.50	52.49*i*	41.53*i*	48.20	37.80*i*
Philadelphia	50.00	.224	.45	2.25	6.00	150.00	180.00	.54	1.80	64.5*i*	55.5*i*	62.*i*	52.5*i*
Pittsburgh	56.00	.182†	.351†	1.62†	4.92†	97.80	154.20	.85*g*	2.00*g*	64.5*j*	55.5*j*	62*j*	52.5*j*
St. Louis	53.00	.28	.504	2.016	3.96	85.00	170.00	.80	2.00	51.125	39.875	48	36.125
San Francisco	55.00	.315*d*	.567*d*	2.268	5.67	103.50	172.50	.45	2.50	53	44	42.75	33.33
Seattle	55.50	.294	.441	2.142	5.355	68.00	160.00*f*	.60*f*	1.60*f*	37	27	37	24

‡ Delivered. † F.o.b. *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $50.00. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. *b* Double strength. *c* List to dealer. *d* List. *e* Sales and municipal taxes extra. *f* Less 5% for cash. *g* Culvert pipe. *h* Discounts from standard list for delivery from warehouse, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ½ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92. *i* Resale price to consumer, car load lots shipped from mill. *j* Applies also at Lorain, Ohio, mills. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at destination. WROUGHT IRON PIPE: Base price and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base: Buttweld — 1 in. and 1¼ in. black 30, galv. 14; 1½ in. black 34, galv. 16½; 2 in. black 33½, galv. 16. Lapweld — 2½ in. to 3½ in. black 27½, galv. 12½; 4½ in. to 8 in. black, 28½ galv. 15.

LUMBER, TIMBER, PLYWOOD—PER M FT. B.M., CARLOAD LOTS F.O.B.

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR									LONG LEAF Y. P.		PLYWOOD	
	All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face) *All Fir planks No. 2 common; Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)*									Merchantable grade up to 20 ft		Rail freight increment (See note for base price)	
	1x6, S4S	1x8, S4S	2x4, S4S	2x6, S4S	2x8, S4S	2x10, S4S	3x12, R&S	6x12, R&S	12x12, R&S	2x12, R&S	12x12, R&S	5/8"	3/4"
Atlanta	**$17.00**	**$17.00**	**$16.50**	**$16.50**	**$17.00**	**$19.50**	**$25.00**	.....	.....	$44.00	$50.00	$16.80	$20.50
Baltimore	**30.00**	**30.00**	**32.50**	**32.50**	**32.50**	**35.00**	**44.00**	.....	.....	66.00	66.00	16.45*f*	20.05*f*
	35.00	*35.00*	*36.50*	*34.00*	*34.00*	*35.00*	*38.00*	*$37.00*	*$36.00*	.....	.....	.....	.....
Birmingham	**22.00**	**22.00**	**24.00**	**23.00**	**24.00**	**27.00**	**32.00**	**32.00**	**32.00**	.....	.....	15.55	18.95
[1]	26.00	26.00	30.00	29.00	30.00	35.00	54.00	.....	.....	48.00	53.00	.....	.....
Boston	33.00[2]	33.00[2]	38.00[3]	38.00[3]	53.00[1]	60.00[1]	75.00[1]	.....	.....	75.00	75.00	16.45*f*	20.05*f*
	32.00	*32.00*	*38.00*	*38.00*	*38.00*	*40.00*	*40.00*	*48.00*	*48.00*	.....	.....	.....	.....
Chicago	**30.00**	**30.00**	**30.00**	**29.00**	**30.00**	**32.00**	**43.00**	.....	.....	75.00	75.00	12.45	15.15
	35.00	*35.00*	*39.00*	*38.00*	*39.00*	*39.00*		*45.00*	*45.00*				
Cincinnati	**29.50**	**30.50**	**29.50**	**29.50**	**30.50**	**31.50**	**44.50**	.....	.....	52.50	38.50	15.55	18.95
	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	**35.00**	**37.00**	**41.00**	**35.00**	**43.00**	**45.00**	**52.00**	*46.00*	*48.00*	55.00	67.00[8]	15.55	18.95
Dallas *e*	**30.00**	**31.00**	**33.50**	**29.50**	**32.00**	**33.50**	**52.50**	**51.00**	**69.50**	62.50	89.50	13.15	16.05
Denver ‡	46.00[4]	46.00[4]	50.00[4]	49.00[4]	49.00[4]	55.00[4]	54.00[4]	64.00[4]	67.50[4]	.....	.....	9.35	11.35
Detroit	**27.00**	**27.00**	**27.00**	**27.00**	**27.00**	**29.00**	**38.00**	.....	.....	32.00	44.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	*43.00*	*43.00*	*43.00*	.....	.....	.....	.....
Kansas City	**26.00**	**26.00**	**28.00**	**27.00**	**28.00**	**29.00**	**40.00**	.....	.....	55.00	60.00	11.45	13.95
	30.00	*30.00*	*31.00*	*30.00*	*30.00*	*31.00*	*35.00*	*38.00*	*38.00*	.....	.....	.....	.....
Los Angeles *a*	*36.00*	*35.00*	*36.00*	*35.00*	*37.00*	*37.00*	*41.00*	*48.00*	*43.00*	.....	.....	8.90*fg*	10.80*fg*
Minneapolis ‡*b*	54.00[6]	54.00[6]	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.45	13.95
‡	*45.00*	*45.00*	*48.00*	*46.00*	*46.00*	*47.00*	*65.00*	*67.00*	*67.00*	47.00	.....	.....	.....
Montreal [7]	*46.00*	*48.00*	*52.00*	50.00	54.00	69.00	84.00	.....	.....	.....	.....		..
	54.75	*54.75*	*49.25*	*60.75*	*60.75*	*64.25*	*47.00*	.....	.....	.....	.....	.....	.....
New Orleans	**33.00**	**36.00**	**42.00**	**34.00**	**40.00**	**39.00**	**50.00**	.....	.....	54.00	59.00	13.15	16.05
	28.90	*31.50*	*35.90*	*29.50*	*33.00*	*34.00*	*38.00*	.....	.....	.....	.....	.....	.....
New York ‡	**36.00**	**37.00**	**36.00**	**37.50**	**37.50**	**39.00**	**44.00**	.....	.....	80.00	82.50	16.45*f*	20.05*f*
‡	.....	.....	*46.00*	*46.00*	*46.00*	*46.00*	*45.00*	*50.00*	*50.00*	.....	.....	.....	.....
Philadelphia	**25.50**	**27.00**	**26.50**	**27.00**	**28.00**	**29.00**	**31.50**	.....	.....	70.00	70.00	16.45*f*	20.05*f*
	40.00	*40.00*	38.25	*39.00*	*40.00*	*40.00*	*40.00*	*46.50*	*46.50*	.....	.....	.....	.....
Pittsburgh	**38.10**	**39.90**	**47.05**	**42.00**	**45.65**	**46.90**	**59.70**	.....	.....	.....	.....	16.20	19.70
	51.90	*49.60*	*49.60*	*49.00*	*48.90*	*49.25*	*66.55*	*66.55*	*66.55*	.....	.....	.....	.....
St. Louis ‡*c*	**31.00**	**32.00**	**30.00**	**29.00**	**30.00**	**32.00**	**49.00**	*53.00*	*53.00*	73.00	72.00	13.15	16.05
San Francisco *d*	*25.50*	*21.00*	*26.00*	*21.50*	*25.00*	*22.50*	*27.00*	*22.00*	*22.00*	.....	.....	6.95*f*	8.50*f*
Seattle *	*22.50*	*23.50*	*23.50*	*22.50*	*22.50*	*22.50*	*26.00*	*26.00*	*26.00*	.....	.....	0.00	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers' N.C. Pine. [3] Spruce. [4] Native. [6] Western Pine, No. 3 Common. [7] Pine. [8] Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors in Minneapolis and St. Paul get 10% discount from list. *c* 5M ft. or less. *d* At ship's tackle. *e* 10% discount taken off. * August prices quoted on smaller lots; correct prices C/L approximate Sept. Prices.

Note: Special concrete form grade Fir Plywood, 4′ by 8′ panels, 5-ply, sanded 2 sides, water resistant glue, car load lots, delivered per 1000 sq. ft. surface Base price — Seattle: 5/8", $68.00; 3/4", $77.60. For other centers add rail freight increment from table for proper size. Add: for form oil treatment, $2.50 per M. sq. ft.; for mineral paint sealed edges, $1.00 per M; for resin dipped treatment, $10.00 per M. *f* Lower rate by water shipment. *g* 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS		EXPLOSIVES	
	Discounts from latest jobbers list, Sept. 15, 1928 Single or Double Thickness		Per lb. dynamite delivered 50-lb. cases Gelatin	
	A quality	B quality	40%	60%
Atlanta	85%	87%	$0.16	$0.176
Baltimore	88%	87%	.16	.18
Birmingham	87%	89%	.105	.12
Boston	87%	89%	.16*f*	.175*f*
Chicago	86%	87%	.115*d*	.13*d*
Cincinnati	89–10%	91–10%	.17*g*	.19*g*
Cleveland	85–10%	85–10%	.205*h*	.215*h*
Dallas	80%	80%	.16	.170
Denver	85%	86%	.16*i*	.175*i*
Detroit	87–10%	89–10%	.21	.24
Kansas City	86–10%	87–10%	.165	.18
Los Angeles	90%*a*	90@40%	.1725*e*	.1925*e*
Minneapolis	84–10%	85–10%	.175*j*	.19*j*
Montreal	60–30%	70–5%	.18†	.1975†
New Orleans	88%*s* 85%*b*	86%*s* 80%*b*	.16	.185
New York	89%	90%	.23*c*	.245*c*
Philadelphia	88%	89%	.16	.175
Pittsburgh	86%	87%	.1525	.165
St. Louis	88%	88%	.155	.17
San Francisco	78%	83%	.1475	.1625
Seattle	83%	86%	.1675	.1825

a Disc. from list Aug. 1, 1929. *s* Single thickness. *b* Double.

c Additional delivery charge in Queens, Richmond, Kings and South of Canal St., Manhattan, $6 per trip. *d* Carload lots 2½ c. higher in 1 ton lots, 4½ c. higher in less than ton lots. *e* F.o.b. Arsenal. *f* $4.00 delivery charge under 350 lb. *g* F.o.b. warehouse. *h* Delivered and picked up each day for storage at night. *i* F.o.b. Louviers, Colo. *j* 200 # or over. † F.o.b

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb	$2.00–2.85
Calcium chloride, 77–80%, flaked, in 400-lb. drums or 100-lb. moisture proof bags, f.o.b. works, freight equalized with points of competition, per ton	22.00–35.00
Chlorine cylinders, per lb. delivered	.055
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	1.25

PILES, TIES—F.O.B.

PILES

Prices per linear foot, pine, with bark on, f.o.b. New York; delivered from barge 1½ to 2c. per ft. additional:

Dimensions	Points	Length	Short Leaf Barge	Short Leaf Rail
12 in. at butt	6 in.	30 to 50 ft.	$0.18	$0.195
12 in.—2 ft. from butt.	6 in.	50 to 59 ft.	.225	.24
12 in.—2 ft. from butt.	6 in.	60 to 69 ft.	.23	.255
14 in.—2 ft. from butt.	6 in.	50 to 69 ft.	.24	.265
14 in.—2 ft. from butt.	6 in.	70 to 79 ft.	.265	.275
14 in.—2 ft. from butt.	5 in.	80 to 85 ft.	.38	.415
14 in.—2 ft. from butt.	5 in.	85 to 89 ft.	.42	.482

RAILWAY TIES

Prices f.o.b., per tie, for carload lots:		6" x 8" x 8′		7" x 9′ x 8′ 6"	
		Untr.	Tr.	Untr.	Tr.
Boston	Oak	$1.20	....	$1.75	....
	Pine	1.25	$1.75*a*	1.90	$2.65*a*
New York	S.L. Sap Pine	1.00/1.10	1.85*g*	1.25	2.30*g*
	Mixed Oak	1.45	....	1.75	....
Birmingham	White Oak	.85	1.50*a*	1.35	1.70*a*
	Southern Pine	.55*b*	1.10*ab*	.70	1.30*a*
Chicago	Oak	....	1.67*ac*	....	2.05*ac*
	Oak	....	1.55*d*	....	1.90*d*
	Southern Pine	....	1.50*a*	....	1.95*a*
Los Angeles	Douglas Fir	.64	1.38*a*	.90	1.80*a*
Philadelphia	Red Oak	1.25	....	....	2.60*a*
St. Louis	White Oak	1.25	....	1.60	....
	Red Oak	1.20	1.60*a*	1.50	2.00*a*
	Sap Pine or Cypress	1.05	....	1.35	....
San Francisco	Douglas Fir	1.15*bef*	....	....	2.45*ca*
Montreal	Birch or Maple	.65	1.05*a*	.75	1.35*a*

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 6" x 8" x 8′ 6" *c* Empty cell. *d* Zinc. *e* Green. *f* At ships tackle. *g* Dense pine

CHEMICALS, Continued

Soda ash, 58%, in paper bags, per 100 lb. dense	$1.10
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	27.00–30.00
Sulphate of copper, in bbl., per 100-lb	5.15–5.40

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M, lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M, lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M, in quantity, Common backing	Straight hard	LIME Per ton, Hydrated finishing	in paper, Common hydrated	carload lot, Pulverized or lump
Atlanta	$63.20	$67.40	$126.30	$126.30	$147.40	$168.40	$12.75	$15.15	$19.50	$14.00	$14.00
Baltimore	91.00	98.00	183.00	219.00	315.00	390.00	13.00	17.00	20.00	14.25	25.00
Birmingham	78.75	84.00	157.50	189.00	201.25	242.00	15.00	19.00	3.00*o*	1.75*o*	2.25*n*
Boston	86.25*ab*	92.00*ab*	172.50*ab*	195.90*ab*	211.65*ab*	242.00*a*	16.00*i*	19.00*i*	20.00	15.50	3.50*p*
Chicago	66.00	70.50	132.00	174.30	214.40	245.00	11.00	12.00	16.00	14.00	12.80
Cincinnati	56.45	60.40	115.25	138.70	166.50	206.40	17.50	17.50	15.80	12.70	.....
Cleveland	49.00	52.00	97.50	117.00	149.00	185.00	16.50	16.50	16.80*j*	14.40*j*	2.65*jm*
Dallas	59.00	62.00	125.00	149.00	155.00	177.00	9.50	24.00	19.00	16.00	95
Denver	78.50	88.00	141.50	160.65	196.00	222.50	12.00	15.50	25.00*j*	17.00*j*	25.00
Detroit	71.85	76.65	143.70	230.00	280.00	325.00	15.00	16.00	19.00	16.00	16.00
Kansas City	64.50	66.50	81.00*c*	125.50	159.75	186.25	14.00	24.00	18.90	12.60	10.50
Los Angeles	73.50†*r*	89.50†*r*	128.00*c*†*r*	210.00†*r*	368.00†*r*	460.00†*r*	12.00	14.00	18.70	.....	19.70
Minneapolis	80.35	85.70	146.00	192.85	176.20*d*	245.20*d*	13.10	15.10*g*	21.00	16.00	19.00
Montreal	84.00*a*	96.00*a*	180.00*a*	......	273.00	......	15.50†	20.75†	23.50	17.00	11.00
New Orleans	72.00	72.00	135.00	162.00	180.00	220.00	14.00	.....	18.30	12.60	.....
New York	87.00	93.00	128.00*c*	193.30*h*	238.80*h*	295.60*h*	Unsettled	.....	20.00	15.50	20.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	.....	.....	16.10*q*	11.40*q*	10.90*q*
Pittsburgh	58.40	62.30	116.85	165.00	217.00	250.00	17.50	25.00	17.50	15.20	2.30*m*
St. Louis	62.00	65.00	120.00	180.00	234.00	280.00	16.00	17.00	.55*k*	.40*k*	1.80*lm*
San Francisco	84.00	94.50	225.00	......	......	......	15.00	18.00	.55*o*	.40*o*	2.05*m*
Seattle	90.00	100.00	200.00	......	......	......	18.00*f*	18.00	20.00*s*	20.00*s*	28.00*s*

a Smooth. *b* Carload lots delivered to job. *c* 6 x 12 x 12 in. *d* Not load bearing. *e* 8 x 8 x 8 in. only. *f* Less $1.00, ½ cash 15 days, balance 30 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* 50c per M off for cash. *j* LCL. *k* Per sack. *l* Lump. *m* Per bbl., 180 lb. *n* Per sack 100 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag. *q* 15-ton cars. *r* 5% discount 10 days. *s* 2% off cash. † F.o.b.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

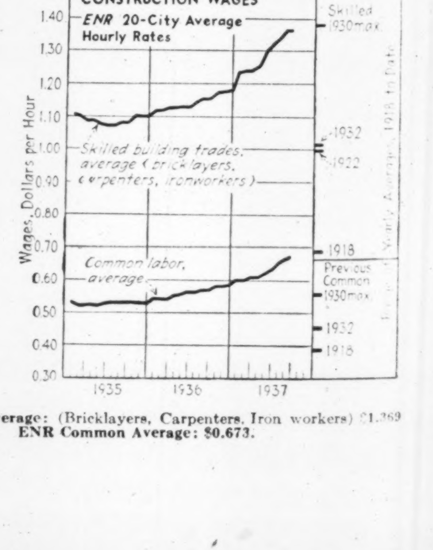
	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in 500-lb. lots in oil	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *c*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f. o. b. factory Rolls, slate surfaced, 85-90 lb., per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch, 350 lb. bbl., per ton
Atlanta	$10.25	$12.375	$1.62	$3.17	$1.40	$2.68	$2.36	$2.36	$.36	$29.40
Baltimore	10.00	12.00	1.45	2.25	1.70	2.16	2.75	2.75	.40	27.50
Birmingham	10.25	12.375	2.35	2.35	1.85	2.16	2.14	2.14	.45	29.25
Boston	10.00	12.00	1.90‡	2.30‡	2.11‡	1.96‡	2.25*h*‡	2.14*h*‡	.45‡	20.00‡
Chicago	10.00	12.00	1.80	....	....	2.47	2.37	2.37	.43	33.00
Cincinnati	10.00	12.00	1.45	2.50	1.40	2.40	2.39*h*	2.39*h*	.36	21.00
Cleveland	10.00	12.00	1.90	2.60	1.40	2.10	2.14*h*	2.14*h*	.32	29.00
Dallas	10.25	12.75	1.80	2.10	....	2.75*h*	2.50*h*	2.50*h*	.60	60.00
Denver	10.50	12.50	....	....	....	2.45	4.00	3.00	.35	28.00
Detroit	10.00	12.00	1.80	2.50	1.50	2.30	2.65	2.50	.35	30.00
Kansas City	10.00	12.125	2.15*g*	2.40*g*	1.67*g*	1.93	3.15	3.15	.25	25.00
Los Angeles	10.25	12.25	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	10.00	12.125	....	....	....	1.85*i*	1.78*hi*	1.78*hi*	.29	23.80
Montreal	.....	8.20	2.00*f*	4.75*f*	2.40*f*	2.50	1.60	1.83	.50	1.52*j*
New York	10.00	12.00	1.90	2.60	1.65	1.85	1.87*h*	1.87*h*	.033*e*	26.00
Philadelphia	10.00	12.00	2.515	2.94	1.515	1.95	2.86*h*	2.86*h*	.29	26.00
Pittsburgh	10.00	12.00	1.05	1.95	.80	1.95	1.94*h*	1.94*h*	.34	26.00
St. Louis	10.00	12.00	1.70/1.90	2.50/2.75	1.50/1.90	1.90/2.00*h*	2.70/2.80	2.70/2.80	.25/.35	28.00/30.00
San Francisco	10.25	12.00	1.80	2.75	1.10–2.00	1.66	1.90	1.90	.325	20.50
Seattle	10.25	12.25	1.80	2.85	2.20	1.98	2.42	2.60	.73	28.00*k*

‡ Delivered. Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% maximum ferric oxide. *e* Per lb. *f* Sales tax extra. *g* 5 gal. cans. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Per 100 lb. *k* Asphalt pitch.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor Building	Heavy Const.
Atlanta	$1.25	$0.40/1.00	$1.00/1.25	$1.00/1.25	$1.25	$0.40/.50	$0.40/.50
Baltimore	1.25	1.25	1.50	1.50	1.25	.45	.45
Birmingham	1.50	1.125	1.25	1.125	1.00	.30/.40*a*	.30/.40*a*
Boston	1.50	.90/1.375	1.375	1.00/1.375	1.625	.60/.85	.60/.85
Chicago	1.70	1.625	1.625	1.625	1.70	1.025	1.025
Cincinnati	1.00/1.625	.70/1.35	1.40	1.00/1.40	1.00/1.625	.60/.75	.60/.75
Cleveland	1.625	1.375	1.50	1.50	1.50	.90	.90
Dallas	1.25	1.00	1.00	1.00	1.25	.40	.40
Denver	1.50*b*	1.50*b*	1.43*b*	....	1.43*b*	.714*b*	.714*b*
Detroit	1.50	1.25	1.50	1.50	1.55	.75/.80	.75/.80
Kansas City	1.325	1.25	1.25	1.25	1.45	.80	.45/.50
Los Angeles	1.10	1.10	1.125	1.25	1.25	.625	.625
Minneapolis	1.375	1.25*e*	1.50	1.40	1.50*f*	.85	.85
New Orleans	1.00	.75/1.00	1.00/1.25	1.00	1.00	.30/.40	.30/.40
New York	1.886*b*	1.75*b*	1.925	2.00*b*	2.00*c*	.95	.875/.95
Philadelphia	1.50	1.00	1.375	1.50	1.375	.40/.50	.40/.50
Pittsburgh	1.75	1.50	1.50	1.25	1.75	.80	.70
St. Louis	1.50	1.25	1.75	1.57/1.75	1.50	.875	.45/.875
San Francisco	1.75*c*	1.50	1.50	1.50	1.50*cd*	.75	.60
Seattle	1.60*c*	1.25*c*	1.50*c*	1.50*c*	1.60*c*	.90*c*	1.00*c*
Montreal	.80	.70	.75	.70	.80	.40	.35

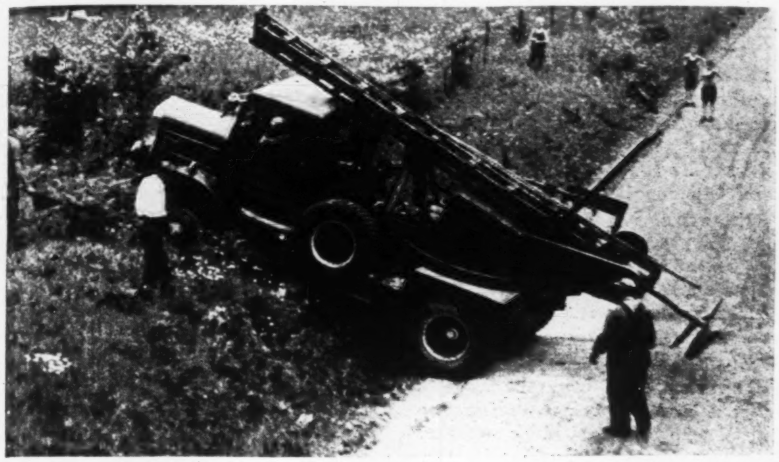
a PWA *b* 7 hr. day. *c* 6 hr. day. *d* On strike for $1.75/hr. *e* 35 hr. wk. *f* 30 hr. wk.



ENR Skilled Average: (Bricklayers, Carpenters, Iron workers) $1.369
ENR Common Average: $0.673.

NEW AIDS TO THE *CONSTRUCTOR*

Equipment and material announcements and manufacturers' news



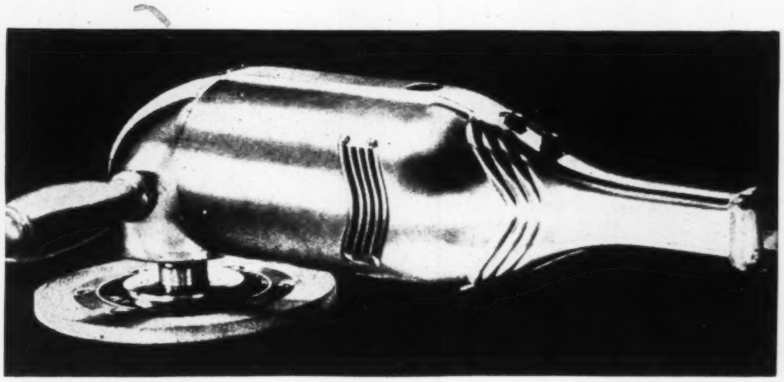
Truck-Mounted Earth Borer

This boring machine, one of two recently manufactured for railroad use, is mounted on an FWD Model SSU truck manufactured by the Four Wheel Drive Auto Co., Clintonville, Wisc.

The four wheel drive truck, equipped with dual tires front and rear and with hydraulic power steering, gives unusual maneuverability.

The boring tower is 18 ft. high and the auger shaft 20 ft. long.—said to be the largest of their kind ever built. The machines are furnished with both 30 in. and 36 in. augers. The digging tower is raised by two large coil springs of anti-gravity type. The operator's seat is placed on the side of the boring machine frame beside the digging mechanism. From this point the operator may watch the digging.

The boring machine mechanism is mounted on a turntable so that the operator may dig holes on either side of the truck or behind it.



Streamlined Sander

The streamlined design of the new Skilsaw sander achieved by Designers for Industry, Inc., of Cleveland, in its redesign of the product for Skilsaw, Inc., of Chicago, is said to have a number of advantages in addition to its attractive appearance. The sander is designed to be light in weight and in good balance.

The grip handles are styled to give comfort and complete control to the operator even under very heavy sanding loads.

Motor and commutator are protected against abrasives by a louvre-type air filter, and straight line ventilation assures a cool running tool, the air emerging at ventilating points which are so designed as to direct it away from the operator of the tool.

GIVE THE NIGHT SHIFT
Daytime Efficiency
WITH HOMELITE
PORTABLE FLOODLIGHTING

Night work goes on at top speed when Homelite portable floodlighting goes on the job. For this light-weight unit provides an ever-ready, dependable supply of brilliant floodlighting your men need for fast, effective work on night construction or repairs.

One man carries the unit easily—sets it up wherever needed. Starting is quick, easy in coldest, rainiest weather. Operation is steady, smooth, automatic. Air-cooled engine won't flood, freeze or overheat.

Homelites save time, speed work night or day—Furnish electricity for operating portable tools as well as for lighting.

Get the whole story. Just clip the coupon. No obligation.

650-watt generator weighs only 71 pounds complete.
1250-watt generator weighs only 89 pounds complete.

HOMELITE
CORPORATION

809 Riverdale Ave., Port Chester, N. Y.
Gentlemen:
Please send me your bulletin giving complete facts on the 3" self-priming Homelite Pump—without obligation.
Name ....
Street ....
City.................. *State*..................

Safety Hats

A new line of safety hats which they they call "Tuff-Nuts" and claim to weigh 10 per cent less than any other similar hat, has just been placed on the market by E. D. Bullard Co. of San Francisco.

The Tuff-Nut is molded in a single-piece crown flared at the base to form the brim. The crown is non-rigid, non-brittle and weather resistant. Ventilation is provided by an air space between the sweatband and the crown.

A feature of the new Tuff-Nut hat is a plastic sweatband made from a transparent material that is cool-feeling, self-shaping to the head and non-absorbent. The band may be cleaned by merely wiping. Sweatbands of more than one size may be placed in the same size crown, reducing the number of sizes which must be kept in stock.

Three models are furnished, the Shorty, with short brims front and back; the Drifter, with short front and side brim and wide back brim; and the Cap. All models are furnished in olive green.

• • •

New Concrete Service

A new company, the Scientific Concrete Service Corp., has recently been organized to offer the Toledo method of precise and largely automatic control of concrete to central concrete mixing plants. This system, developed by the Toledo Scale Co. several years ago, is now offered under exclusive license by the new corporation. The system was used in the construction of the Thomas W. Koon dam near Cumberland, Md., in 1931 and has been in use at a number of ready-mix plants since that time.

The new organization contemplates the installation of Toledo method equipment in plants, providing the services of a trained concrete technician to design and check the mix properties and to supervise the operation.

Colonel Sidney F. Mashbir is president of the new company, and R. E. Robb and Samuel Scrivener are vice-president and secretary, respectively.

NEW PUBLICATIONS

GOOD READING for the hot weather is provided by a catalog, No. SNP-1 of American Snow Plows and Wings.—American Hoist & Derrick Co., St. Paul, Minn.

PAINT REQUIREMENTS of gas holders are described in the six mimeographed pages of a paper entitled "Scientific Procedure for Determining Paint Requirements for Water-sealed Gas Holders," by J. J. O'Loughlin.—Joseph Dixon Crucible Co., Jersey City.

ATTRACTIVE job photos, specifications, and design data on Irving open mesh steel decking for bridges, are included in a new pamphlet as well as an account of the advantages of this type of pavement.—Irving Iron Works Co., Long Island City, N. Y.

"TOOLS OF INDUSTRY" is the title of a 184-page catalog of the Williams industrial line of drop forged wrenches and other standard stock specialties. Several new items and lines are included in the pocket-size book.—J. H. Williams & Co., New York City.

BULLETIN 15 is a new catalog of Kinney liquid and vacuum pumps.—Kinney Manufacturing Co., Boston, Mass.

HANDSOMELY printed in colors, provided with plastic binding, and containing a wealth of photographs, a new Blaw-Knox catalog describes Trukmixers, agitators and ready mixed concrete plants.—Blaw-Knox Co., Pittsburgh.

A NEW EDITION of "Hard-Facing with Haynes Stellite Products" contains added information concerning special Haynes Stellite J-metal cutting tools and the corrosion-resistant Hastelloy alloys. A number of examples of hard-facing automotive and aircraft valves and valve seat inserts and of the use of Haynes Stellite trim for high-temperature, high-pressure steam valves, are now also described in detail.—Haynes Stellite Co., Kokomo, Ind.

THE COMPLETE line of Littleford tar and asphalt heating kettles is described in Bulletin M-1.—Littleford Bros., Cincinnati.

INTEGRAL waterproofing of concrete is discussed and photographic examples of its use given in a new Medusa pamphlet.—Medusa Portland Cement Co., Cleveland.

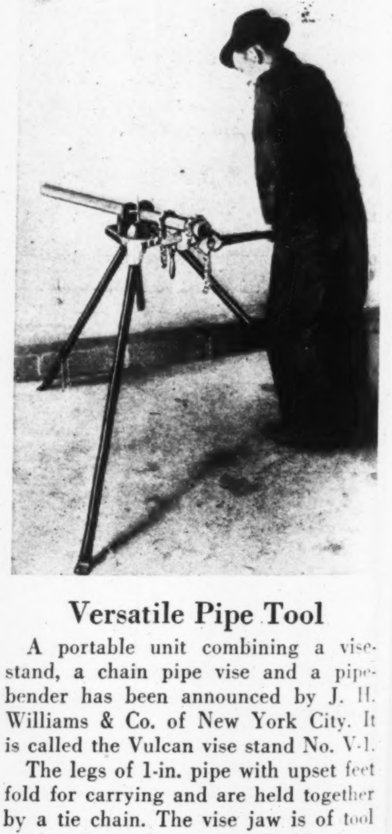
AN IMPRESSIVE "Water Works Manual" appears to contain a great deal of basic hydraulic information and engineering data as well as useful tables on flow capacity and pipe line computations. The manual has been issued in loose-leaf form with a permanent binder to facilitate the addition of further information which will be sent out from time to time.—Water Works Division, Youngstown Sheet & Tube Co., Youngstown, Ohio.

PRACTICAL information in non-technical language on the care and maintenance of conveyor and elevator belting is included in a new 20-page belt-maintenance manual, No. 2800.—B. F. Goodrich Co., Akron, Ohio.

A CATALOG of Yeomans pumps has been prepared for the use of architects and mechanical engineers. It includes considerable information on the choice of pumps for different types of application.—Yeomans Bros. Co., Chicago.

BROWN electric instruments for the measurement and recording of carbon dioxide concentrations are described in catalog 3005.—The Brown Instrument Co., Philadelphia, Pa.

A MULTITUDE of application pictures and descriptions of the various types of Sterling engines used for engine-driven generator sets is included in a good-looking 23-page booklet.—Sterling Engine Co., Buffalo.



Versatile Pipe Tool

A portable unit combining a vise-stand, a chain pipe vise and a pipe-bender has been announced by J. H. Williams & Co. of New York City. It is called the Vulcan vise stand No. V-1.

The legs of 1-in. pipe with upset feet fold for carrying and are held together by a tie chain. The vise jaw is of tool steel and the base of malleable iron. The stand weighs 35 lb. and takes pipe from ⅛ to 2 in. in diameter. The pipe-bender handles pipe up to ¾ inch.

What a Doubting Thomas learned about the "Moly" shovel

(HOW AN ADVERTISING COPY WRITER WAS CONVINCED)

This is not a testimonial, but an unembellished experience of my own.

In preparing an advertising campaign for the WOOD'S Moly Shovel, certain facts were given me about the shovel's stamina that I frankly questioned. Even with my knowledge of the added strength of molybdenum steel, I found it hard to believe such things as a ten ton steam roller passing over the shovel without flattening it . . . as a sharp steel electric drill breaking when attempting to bore holes in the blade.

I voiced my doubts to the Sales Manager and was immediately taken in hand.

He took me into the factory, picked up the first WOOD'S Moly that was handy and with all his might crashed it blade first into a cast-iron door casement. He might as well have driven it into butter, for nary a mark appeared on the shovel. (The iron casement didn't fare as well).

Next, he put the blade into a vise and bent it ninety degrees. The shovel snapped right back into its original shape. Altogether he gave that Moly Shovel one of the most thorough beatings I have ever witnessed, chipping up cement floors, chopping timber, and what have you. When he finished there wasn't a mark on the shovel, not even the slightest dent. It was still as good as new.

Even though I saw these things with my own eyes, it seems incredible that a piece of shovel steel can be so tough. I understand now why the WOOD'S Moly with its molybdenum steel blade has actually proved that it outlasts five ordinary shovels. And to shovel purchasers this fact should point the way to definite economies on their shovel bills.

Take it from one who has seen, this WOOD'S Moly Shovel is unique, both in wearing and lasting qualities . . . well worth anyone's time to write for complete details. Just address THE WOOD SHOVEL AND TOOL COMPANY, Piqua, Ohio.

WOOD'S Moly SHOVELS

REG. U.S. PAT. OFF.

(Contract Unit Prices continued from page 448)

for same items built of timber and corrugated metal. Three complete proposals were submitted ranging from $58,742 to $66,089 for excavation of laterals (eng. estimate $65,491); from $85,082 to $90,661 for concrete works (eng. estimate $83,804); from $79,567 to $84,024 for timber and metal works (eng. estimate $83,804). One other bid submitted for control works only. Contract awarded one contractor for lateral excavation and metal and timber control works. In following tabulations main items as listed are for metal and timber control works; alternates are corresponding concrete works items.

LOW BIDDERS:

1. M. E. Gillioz, Inc., Monett, Mo.:
   - Lateral excavation (contract) $58,742
   - Metal and timber control works (contract) ... 79,567
   - Concrete control works 85,355
2. Morrison-Knudson Co., Loup City, Nebr.:
   - Lateral excavation 61,669
   - Metal and timber control works 81,499
   - Concrete control works 85,082
3. Inland Construction Co., Omaha, Nebr.:
   - Lateral excavation 66,089
   - Metal and timber control works 84,024
   - Concrete control works 90,661

LATERAL EXCAVATION

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Excavation	410,730 c. y.	$0.12	$0.12	$0.138
2. Compacted embankment	29,270 c. y.	.20	.30	.18
DROPS CHECKS AND FLUME — TIMBER				
1. Excav., common	445 c. y.	.35	.25	.75
2. Excav., structures	620 c. y.	1.25	.60	.75
3. Concrete	419 c. y.	19.00	20.00	24.00
4. Reinforcing steel	39,000 lb.	.05	.055	.05
5. Misc. iron	14,750 lb.	.15	.20	.15
6. Corr. metal pipe, dipped, 12-in.	12 ft.	1.50	1.60	1.30
7. Corr. metal pipe, dipped, 15-in.	260 ft.	1.75	1.40	1.75
8. Corr. meal pipe, dipped, 18-in.	68 ft.	2.00	1.80	2.30
9. Corr. metal pipe, dipped, 24-in.	82 ft.	2.75	2.50	2.75
10. Corr. metal pipe, dipped, 30-in.	124 ft.	3.50	4.00	3.80
11. Corr. metal pipe, dipped, 36-in.	54 ft.	4.25	5.90	5.80
12. Gate, 12-in.	1 each	20.00	30.00	14.00
13. Gate, 15-in.	17 each	25.00	45.00	17.50
14. Gate, 18-in.	4 each	30.00	50.00	25.50
15. Gate, 30-in.	7 each	70.00	75.00	65.00
16. Gate, 36-in.	3 each	90.00	85.00	75.00
17. Timber	15.7 Mfbm	125.00	120.00	115.00
18. Lock asssmblies	32 each	2.00	5.00	4.00
Alternates — Concrete Pipe:				
3A. Concrete struct	498 c. y.	19.00	20.09	23.00
4A. Reinf. steel	45,300 lb.	.05	.055	.05
5A. Struc. iron	19,200 lb.	.15	.20	.16
9A. Reinf. conc. pipe, 24-in	82 ft.	2.50	2.60	2.65
STATE ROAD CULVERTS — METAL PIPE				
1. Excav., common	80 c. y.	$0.35	$0.50	$0.75
2. Excav., structures	670 c. y.	1.25	.60	.75
3. Concrete	61 c. y.	19.00	20.00	20.00
4. Reinf. steel	4,880 lb.	.05	.06	.05
5. Corr. metal, pipe, 18-in	40 l. f.	1.85	2.25	2.10
6. Corr. metal pipe, 24-in	132 l. f.	2.50	2.69	2.30
7. Corr. metal pipe, dipped, 24-in.	132 l. f.	2.75	3.00	2.50
8. Corr. metal pipe, dipped, 30-in.	66 l. f.	3.25	4.00	3.75
9. Corr. metal pipe, dipped, 42-in.	66 l. f.	6.25	6.00	6.00
Alternates — Concrete Pipe:				
5A. Reinf. conc. pipe, 18-in.	40 l. f.	2.00	2.00	2.30
6-7A. Reinf. conc. pipe, 24-in.	264 l. f.	2.50	2.60	2.50
8A. Reinf. conc. pipe, 30-in.	66 l. f.	3.75	3.90	3.75
9A. Reinf. conc. pipe, 42-in.	66 l. f.	6.50	4.75	7.00
COUNTY ROAD CULVERTS — METAL PIPE				
1. Excav., common	2,050 c. y.	$0.35	$0.25	$0.75
2. Excav., structures	3,600 l. f.	1.25	.60	.75
3. Concrete	504 c. y.	19.00	20.00	23.00
4. Reinf. steel	40,320 lb.	.05	.055	.05
5. Corr. metal pipe, 18-in	1,676 l. f.	1.85	2.25	2.30
6. Corr. metal pipe, 21-in	308 l. f.	2.25	2.50	2.50
7. Corr. metal pipe, 24-in	1,460 l. f.	2.50	2.60	2.75
8. Corr. metal pipe, 30-in	192 l. f.	3.00	3.25	3.75
9. Corr. metal pipe, 36-in	284 l. f.	4.50	5.25	5.75
10. Corr. metal pipe, 42-in	620 l. f.	5.50	6.00	6.00
11. Corr. metal pipe, 48-in	472 l. f.	6.50	7.50	6.70
12. Corr. metal pipe, dipped, 21-in.	28 l. f.	2.50	2.75	2.70
13. Corr. metal pipe, dipped, 24-in.	96 l. f.	2.75	3.00	2.80
14. Corr. metal pipe, dipped, 42-in.	28 l. f.	6.25	6.50	6.00
Alternates — Concrete Pipe:				
5A. Reinf. conc. pipe, 18-in.	1,676 l. f.	2.00	2.00	2.10
6-12A. Reinf. conc. pipe, 21-in.	336 l. f.	2.25	2.25	2.40
7-13A. Reinf. conc. pipe, 24-in.	1,256 l. f.	2.50	2.60	2.50
8A. Reinf. conc. pipe, 30-in.	192 l. f.	3.75	2.85	2.75
9A. Reinf. conc. pipe, 36-in.	284 l. f.	5.00	3.75	5.50
10-14A. Reinf. conc. pipe, 42-in.	648 l. f.	6.50	5.25	6.00
11A. Reinf. conc. pipe, 48-in.	472 l. f.	7.50	6.25	7.00
LATERAL TURNOUTS FROM MAIN CANAL — METAL PIPE				
1. Excav., common	150 c. y.	$0.35	$0.50	$0.7
2. Excav., structures	240 c. y.	1.25	.60	.7
3. Concrete	137 c. y.	19.00	20.00	23.0
4. Reinf. steel	13,560 lb.	.05	.055	.0
5. Misc. iron	1,080 lb.	.15	.20	.1
6. Corr. metal pipe, 12-in.	160 l. f.	1.50	1.50	1.2
7. Corr. metal pipe, 15-in.	66 l. f.	1.75	1.80	1.5
8. Corr. metal pipe, 21-in.	64 l. f.	2.25	2.50	2.5
9. Corr. metal pipe, 24-in.	30 l. f.	2.50	2.60	2.6
10. Corr. metal pipe, 30-in.	84 l. f.	3.00	3.25	3.7
11. Corr. metal pipe, 42-in.	28 l. f.	5.50	5.70	6.0
12. Corr. metal pipe, dipped, 12-in.	1'0 l. f.	1.50	1.60	1.
13. Corr. metalpipe, dipped, 30-in.	30 l. f.	3.50	4.00	3.
14. Corr. metalpipe, dipped, 42-in.	36 l. f.	6.25	6.50	5.
15. Meter gates, 12-in.	12 ea.	30.00	40.00	33.
16. Meter gates, 15-in.	2 ea.	35.00	45.00	38.
17. Meter gates, 21-in.	4 ea.	50.00	60.00	58.
18. Meter gates, 24-in.	1 ea.	55.00	80.00	65.
19. Meter gates, 30-in.	5 ea.	86.00	90.00	95.
20. Meter gates, 42-in.	1 ea.	130.00	150.00	150.
21. Gate, 42-in.	1 ea.	125.00	116.50	120.
22. Treated lumber	0.4 Mfbm.	125.00	120.00	120.
23. Lock assemblies	25 ea.	2.00	5.80	4.
Alternates — Concrete Pipe:				
6-12A. Reinf. conc. pipe, 12-in.	300 l. f.	1.50	1.00	1.
7A. Reinf. conc. pipe, 15-in.	66 l. f.	1.75	1.20	1.8
8A. Reinf. conc. pipe, 21-in.	64 l. f.	2.25	1.80	2.5
9A. Reinf. conc. pipe, 24-in.	30 l. f.	2.50	2.60	2.7
10-13A. Reinf. conc. pipe, 30 in.	114 l. f.	3.75	2.85	3.7
11A. Reinf. conc. pipe, 42-in.	28 l. f.	6.00	55.5	2.7
TURNOUTS FOR SMALL LATERALS — METAL PIPE				
1. Excav., common	80 c. y.	$0.35	$0.50	$0.75
2. Excavation, structures	120 c. y.	1.25	.60	.75
3. Concrete	88 c. y.	19.00	20.00	20.00
4. Reinf. steel	7,210 lb.	.05	.06	.05
5. Misc. iron	960 lb.	.15	.20	.16
6. Corr. metal pipe, 12-in.	120 l. f.	1.50	1.50	1.20
7. Corr. metal pipe, 21-in.	8 l. f.	2.25	2.50	2.30
8. Corr. metal pipe, 24-in.	10 l. f.	2.50	2.60	2.70
9. Corr. metal pipe, 36-in.	8 l. f.	4.50	5.25	5.40
10. Meter gates, 12-in.	14 ea.	30.00	40.00	35.00
11. Meter gates, 21-in.	1 ea.	50.00	60.00	55.00
12. Meter gates, 24-in.	1 ea.	55.00	80.00	60.00
13. Meter gares, 36-in.	1 ea.	90.00	95.00	100.00
14. Treated lumber	26 Mfbm.	125.00	120.00	120.00
15. Lock assemblies	38 ea.	2.00	5.00	4.00
Alternates — Concrete Pipe:				
6A. Reinf. conc. pipe, 12-in.	120 l. f.	1.50	1.00	1.30
7A. Reinf. conc. pipe, 21-in.	8 l. f.	2.25	2.25	2.50
8A. Reinf. conc. pipe, 24-in.	10 l. f.	2.50	2.60	2.75
9A. Reinf. conc. pipe, 36-in.	8 l. f.	5.00	3.75	5.50
TURNOUTS FROM SMALL LATERALS — TIMBER				
1. Excav., common	560 c. y.	$0.35	$0.50	$0.75
2. Excav., structures	620 c. y.	1.25	.60	.75
3. Concrete	50 c. y.	19.00	25.00	25.00
4. Reinf. steel	3,800 lb.	.05	.06	.06
5. Misc. iron	690 lb.	.15	.20	.20
6. Treated lumber	76 Mfbm.	125.00	110.00	100.00
7. Lock assemblies	297 ea.	2.00	5.00	4.00
Alternates — Concrete structures:				
3A. Concrete	482 c. y.	19.00	20.00	20.00
4A. Reinf. steel	36,200 lb.	.05	.055	.06
5A. Misc. iron	11,950 lb.	.15	.20	.20
6A. Treated lumber	3 Mfbm.	125.00	120.00	120.00

SAVANNAH RIVER DIKES

OWNER: U. S. War Dept., Savannah, Ga.; Lt. Col. R. F. Fowler, Dist. Engineer.

PROJECT: Construction of 1,490 lin.ft. timber pile dikes and 2,900 lin.ft. of bank protection at Mile, 142, 154 and 159, on Savannah River in Georgia and South Carolina.

BIDS: Four bids were opened July, 1937, ranging from the contract low of $99,707 to a high of $126,999. The three locations are accessible by river and highway. Completion is scheduled for 150 days after contract award. Minimum hourly wage rates are stipulated at $1.00 for skilled and 40c. for common labor.

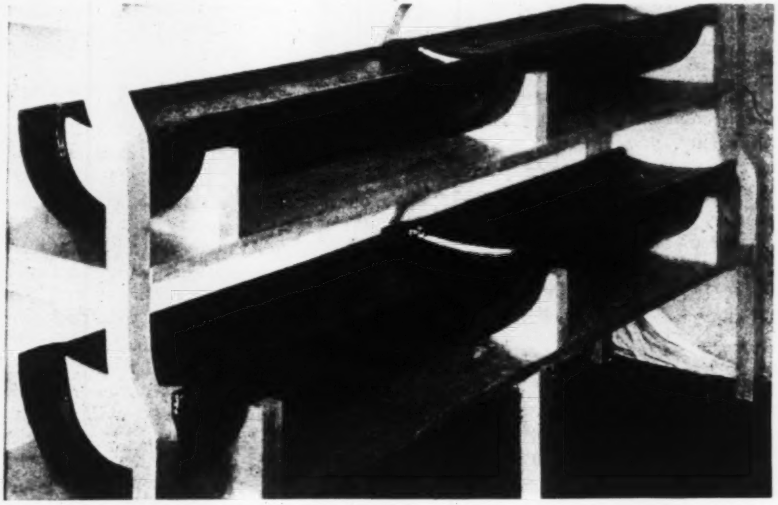
LOW BIDDERS:

1. C. Y. Thomason Const. Co., Greenwood, S. C. (contract) $99,707
2. Simons-Mayrant Co., Charleston, S. C. 107,455
3. Salmon Dredging Co., Charleston, S. C. 117,244

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Wood piles, creosoted	23,416 l. f.	$1.00	$0.90	$0.95
2. Lumber mattress, dike	384 sq.	13.00	15.00	12.00
3. Stone mattress, dike	1,305 ton	4.00	4.75	5.33
4. Paving stone	2,261 ton	4.50	5.50	6.97
5. Grading	3,780 c. y.	.80	.75	1.00
6. Lumber mattress, bank	1,240 sq.	15.00	15.00	12.00
7. Stone mattress, bank	2,315 ton	4.00	4.75	5.33
8. Paving stone, bank	4,760 ton	4.50	5.50	6.97
9. Grading, bank	4,500 c. y.	.80	.75	1.00

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Quick Runoff Provided By New Drain Pipe

A sloping-cradle invert pipe system of patented design has been developed by the Dimick-Mosher Products Co., Boston, for subdrainage of highways, freight yards, and airports. The new products, "Skip-Pipe," as may be seen in the picture (inside of pipe is painted white for clarity in the picture) is a cast iron pipe laid in sections. It catches the water on the sloping cradle of the pipe invert and discharges it at each joint to the carry-off section below. Operation is by gravity flow, and no hydrostatic head is required. The new drain system is said to start quickly, drain thoroughly, and carry off the water several times faster than will perforated pipe.

Each length of pipe is cast as a unit, with minimum section length of 3 ft., and a standard $^3\!/_8$-in. opening between sections. Pipes are cast with hub and spigot joints in diameters ranging from 8 to 18 in.

The pipe is to be manufactured in numerous foundries under license.

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New Sales Plan For Steel

A new plan for selling steel accompanied by exact information on the particular steel delivered was introduced Sept. 1 by Joseph T. Ryerson & Son, Inc., of Chicago. The plan is known as the "Ryerson Certified Steel Plan."

Under the operation of the plan, specifications for steel to be heat-treated are set up considerably closer than the S.A.E. specifications. Those heats of steel which meet the specifications are then marketed on the new plan.

Samples are taken of each, and complete tests and analyses of the physical properties and heat treating characteristics of the steel are made and charted. An identifying heat number is stamped on all bars rolled from that particular heat, and when bars are delivered to the purchaser he receives copies of the complete test results. The purchaser can then proceed immediately to heat treatment, without making tests.

• • •

Refractory Concrete Is Light Weight

Insulcrete is a light-weight insulating and refractory concrete manufactured by the Quigley Co., of New York City. The light weight of the product, only 60 lb. per cu.ft., combined with high insulating properties are said by the manufacturer to give a wall of Insulcrete the same insulating power as a wall of firebrick weighing seven times as much.

Insulcrete is cast monolithicly. It comes in dry form and is mixed with water on the job and poured into suitable forms. It sets with very little shrinkage or expansion and is ready for service in 24 to 36 hr.

Iron Curb Armor

Malleable iron curb armor is now being put out by the Chicago Malleable Castings Co., Chicago. The curb armor is made of corrosion-resisting iron and is adaptable to any kind of curbing, straight or curved, regardless of the curve radius. Straight sections are cast in 24 in. units and returns in 4 in. sections.

For installation, the armor is inserted in the concrete immediately after pouring and concrete is tamped beneath the armor unit. Leveling and final finishing complete the job. A special anchor design prevents loosening by impact or heat expansion, and beveled over-lapping edges on each section prevent traffic from ripping the armor loose and prevent damage to tires and wheels. Street widths can be increased by use of armor about one foot over the width possible with a granite curb without lessening the width of the sidewalk.

• • •

New Fuse Cutout Has Second Wind

A new type of fuse cutout has been announced by the General Electric Co. of Schenectady. The door of the new unit contains two fuse holders. Should the first fuse link blow, the door is pushed outward at the bottom, providing a positive indication. After a time delay of one second, the other fuse holder, with its link, is connected, thus restoring service if the fault is temporary. Should the second fuse blow, the complete door drops open and is isolated from the circuit.

The fuse holder tubes are held in the door by a clip which permits the door to pivot outward at the bottom, except when held in position by the outer fuse link. When the outer fuse link blows, the door is released and a spring pushes the door outward. After a delay of one second, provided by a mechanical timing device of the escapement type, the fuse contact snaps over to the second fuse and current is restored.

If the fault persists, or when another short circuit occurs before the blown fuse link is replaced, the inner fuse link will blow, releasing the toggle mechanism and permitting the door and fuse holder to drop to the open position.

The reclosing mechanism is entirely in the door, which is so constructed that it is interchangeable with the door of present General Electric 50 amp. indicating and drop-out cutouts, making it possible to convert the latter into reclosing cutouts by adding a new door.

MANUFACTURERS' ACTIVITIES

The Asbestos-Cement pressure pipe field is being entered by Keasbey & Mattison Co. of Ambler, Pa. A $760,000 plant is now under construction at Ambler for the manufacture of the company's new line, and production will begin early in 1938. The new plant will have a weekly capacity of 150 tons or about 10 miles of asbestos cement pipe. A second $500,000 plant for the same product will shortly go into construction in St. Louis.

New distributors

The Babcock & Wilcox Tube Co. of Beaver Falls, Pa., have appointed Clowe & Cowan, Inc., of Amarillo, and Lubbock, Texas, as distributors for B&W seamless tubular products in the Texas Panhandle, South Plains and Eastern New Mexico.

E. Howard Boddy of Detroit will handle engineering and sales of the products of Power Piping Corp., a subsidiary of Blaw-Knox Co., Pittsburgh. Mr. Boddy will also handle sales of some other Blaw-Knox industrial products in the Detroit territory, though not construction equipment.

A New District Office in New Orleans has been opened by Cutler-Hammer of Milwaukee. The new office will be under the charge of Joseph Gardberg.

A New Sales engineering office has been opened by The Lincoln Electric Co., of Cleveland, at Bluefield, W. Va. The new office will be in charge of William H. Schuster, who has been assistant welding instructor in the Lincoln welding school at Cleveland for the past year. The new office will maintain a welding consultation and supply service for the coal fields of West Virginia, Virginia and Kentucky.

A Detroit Office has been opened by the Matthews Conveyor Co. of Ellwood City, Pa. C. E. Jeremiah and E. A. Smith will be field engineers in charge.

D. W. Haering & Co., Inc., of Chicago, are offering laboratory and consulting facilities for the Southwest through the Wichita Testing Laboratories of Wichita, Kan., and for the West Coast through Best & Co. of Alameda, Calif., and sales service and warehousing facilities for the East through a new office in New York City under the direction of Leon Garneau.

The Hanson Excavator Works have appointed five new distributors to handle the full line of Hanson excavators and Hanson platform and skeleton trailers. The new dealers are: The Equipment Co., Boston; Dale & Rankin, Inc., Newark; Construction Equipment Co., Hartford; J. Shuman Hower, Utica; and R. C. Stanhope, Inc., New York City.

A New Dayton Office has been established by The Lincoln Electric Co. of Cleveland. The new office will be in charge of R. P. Sharer.

Iron & Steel Products, Inc., Chicago, have opened a Pittsburgh office in charge of C. W. McKirdy.

Plant expansion

Chain Belt Co. of Milwaukee has just completed a new building at its West Milwaukee Works to house an enlarged machine shop and the West Milwaukee offices. Both shops and offices are air conditioned. The new building, 152 ft. by 292 ft., will house nearly all of the machining operations of the company, bringing them close to the assembly plant.

Increased Demand from the automotive industry has prompted the decision by Ferodo & Asbestos, Inc., to add a 46,000-sq.ft. $400,000 building to their New Brunswick, N. J. plant, about doubling the present capacity. A new two-story office building will also be erected.

Contract for the erection of the new $4,000,000 truck engine plant of the International Harvester Co. in southeast Indianapolis has been awarded to the J. L. Simmons Construction Co. of Indianapolis.

A Second Story addition to provide more room for development, research and engineering departments has been announced by The Clark Controller Co. of Cleveland. Contract for the work has been let to J. L. Hunting Co.

A New Factory addition with 25,000 sq. ft. of floor space will be occupied Sept. 1 by Schramm, Inc., air compressor manufacturers of Westchester, Pa. The new structure adjoins their present factory and office building and will house assembly lines and testing and storage departments. A 25,000-sq.ft. outside storage and yard platform has also been constructed.

The Four Wheel Drive Auto Co. has purchased $125,000 in new machinery and equipment to meet increasing demand. Outstanding in the new plant purchased is the complete heat-treating equipment.

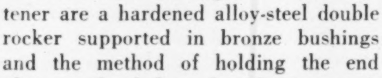
Personnel changes

Three New Vice-Presidents have been appointed by Johns-Manville Products Corp., a subsidiary of Johns-Manville Corp. which controls most of the company's manufacturing activities. A. R. Fisher and J. P. Kottcamp, new vice-presidents, were formerly managers of the Manville, N. J., and Waukegan, Ill., plants, respectively. Alexander Cromwell has been manager of Pacific Coast manufacturing operations. Each of these men will have general supervision over one of three newly established manufacturing districts, each including five factories.

E. S. Crosby has been named president of the Johns-Manville International Corp., a subsidiary of Johns-Manville Corps. H. M. Shackelford has been elected vice-president of the Johns-Manville Sales Corp. For the past three years he has been sales promotion manager for Johns-Manville, which position he retains under his new title.

New Vice-President and general manager of W. A. Riddell Corp. is Neil E. Jersey who succeeds the late H. F. Holbrook. Mr. Jersey has been connected with Riddell since 1924 and has been in charge of the road machinery sales department since 1928. Immediate charge of road machinery sales will now be taken over by C. A. Beal, formerly assistant sales manager.

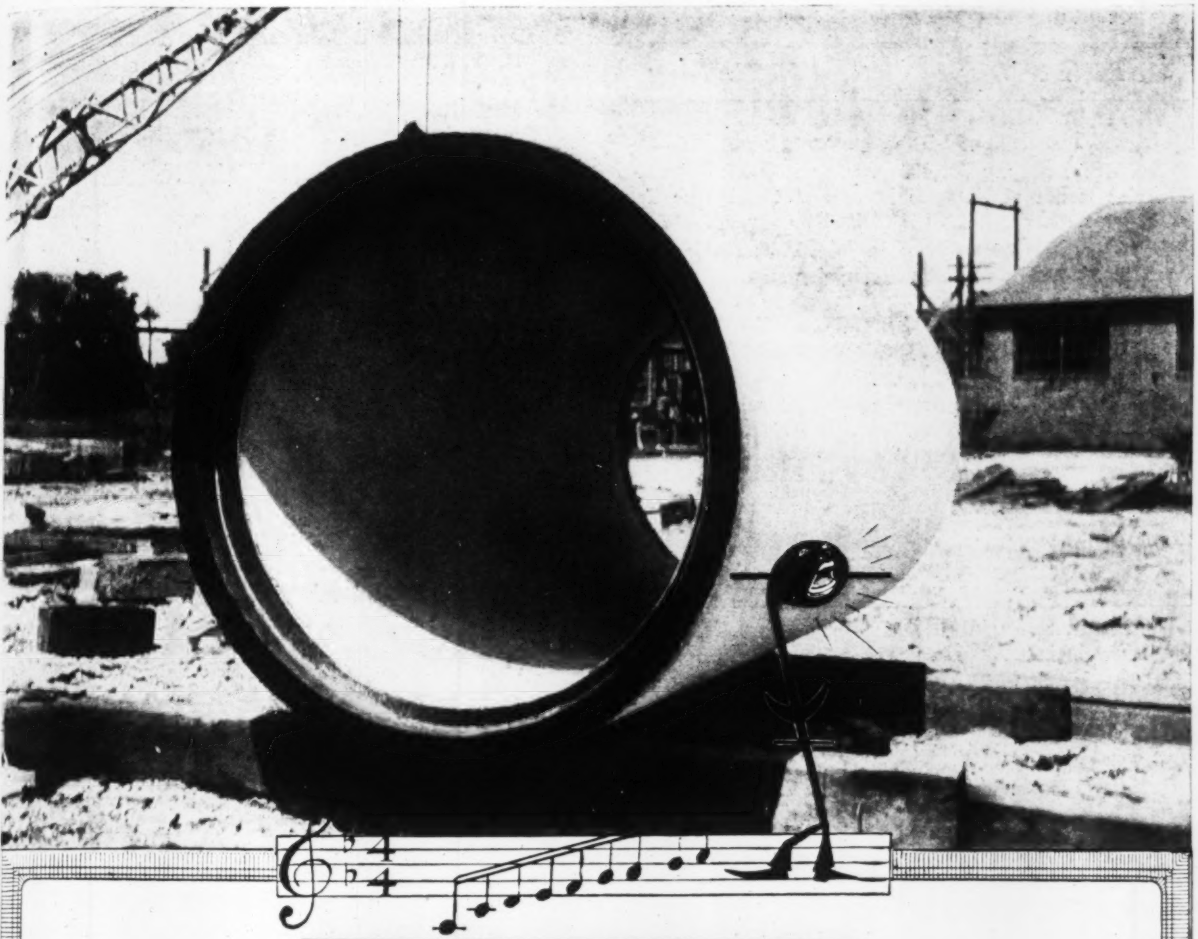
O. E. Romic has been appointed assistant research engineer in the research laboratory of the Pittsburgh district of the Carnegie-Illinois Steel Corp.



V-Belt Fastener

A new fastener for joining C section V-belts of fabric core, cross weave construction is being manufactured by the Flexible Steel Lacing Co. of Chicago. Features of the Alligator V-belt fastener are a hardened alloy-steel double rocker supported in bronze bushings and the method of holding the end plate to the belt end without materially weakening the belt or bulging its sides.

The Alligator fastener is now being made available for general distribution after having been tested in railroad service for several years.



High "C" Is An Achievement

BOTH IN MUSIC AND IN PIPE LINES

THERE are not many singers who can reach and sustain "High C", and even those who attain it readily in their youth find it increasingly harder with advancing years.

So, too, with pipe lines. There are many claims of original "High C" but there are mighty few that can show, by actual experience, an ability to sustain "High C" through long years of carrying tuberculating or corrosive waters.

Don't be misled by unsubstantiated claims. Examine the record and you'll find that the smooth, dense concrete, which completely protects all the steel, has proven over many years to give permanently "High C" in Lock Joint Reinforced Concrete Pressure Pipe.

LOCK JOINT PIPE CO. Est. 1905. Ampere, N. J.
Pressure : Sewer : Culvert : Subaqueous.

LOCK JOINT Reinforced CONCRETE PRESSURE PIPE

(Contract Unit Prices continued from page 488)

RIVER DREDGING, VIRGINIA

OWNER: U. S. Engineer Department, Washington, D. C., District, W. D. Ludlow, Dist. Engineer.

PROJECT: Dredging 165,000 c. y. from Little Wicomico River at mouth of Potomac River and Chesapeake Bay, in Virginia.

BIDS: Four bids were opened in July, 1937, ranging from $36.218 to $40,260, with the low bidder stipulating a rate of prosecution of 60,000 c. y. per month.

LOW BIDDERS:

1. Atkinson Dredging Co., Norfolk, Va.	$36.218
2. Lukens Dredging & Contr. Co., Baltimore, Md.	37,092
3. C. Walker Hodges Dredging Co., New Bern, N. C.	38.610

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Dredging, place measure	165,000 c. y.	$0.234	$0.2195	$0.244

LEVEES, MAGNOLIA, OHIO

OWNER: U. S. Engineer Department; Col. J. D. Arthur, Jr., Dist. Engineer, Zanesville, O.

PROJECT: Construction of an earth levee, 4,560 ft. in length, on Big Sandy Creek, near Magnolia, Ohio.

BIDS: Seven bids were opened in July, 1937, ranging from $161,725 to $235,950. Completion is scheduled for 180 days after contract award; minimum hourly wages stipulated at $1.20 for skilled and 50c. for common labor. The contractor furnishes all labor and materials exclusive only of the raising of the abutments and the bridge over Big Sandy Creek on State Route 80, and the three centrifugal pumps with equipment at the pumping station.

LOW BIDDERS:

1. Nick Cenci, Columbus, Ohio	$161,725
2. Geo. M. Brewster & Son, Inc., Bogota, N. J.	175,875
3. Ralph Myers, Salem, Ind.	180,472

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Diversion, care canal	l. s.	$1,500.00	$2,100.00	$3,000.00
2. Remove old structures	l. s.	200.00	140.00	500.00
3. Clear, grub levee site	l. s.	500.00	973.60	1,800.00
4. Stripping	22,500 c. y.	.25	.294	.25
5. Excav., common	18,000 c. y.	.30	.364	.50
6. Borrow excav., haul	286,000 c. y.	.27	.262	.33
7. Impervious fill	107,000 c. y.	.06	.064	.01
8. Pervious fill	145,000 c. y.	.06	.062	.01
9. Top soil	15,000 c. y.	.25	.31	.35
10. Seed, fertilize	16 acre	250.00	175.00	156.50
11. Struct. backfill, comp	4,100 c. y.	.25	.75	.50
12. Riprap	800 c. y.	8.00	4.27	5.00
13. Gravel filter	500 c. y.	2.50	1.82	2.75
14. Gravel road surfacing	350 s. y.	2.50	.784	.65
15. Concrete	600 c. y.	14.00	20.40	18.00
16. Reinf. steel	36,000 lb.	.05	.055	.06
17. Gal. corr. pipe, 36-in	900 l. f.	9.85	12.60	12.00
18. Gal. corr. perf. pipe, 48-in	500 l. f.	13.32	17.25	15.00
19. Discharge pipe, pumps	26,500 lb.	.07	.10	.10
20. Seep rings, 36 in	9 ea.	142.50	189.00	250.00
21. Gates, accessories	l. s.	1,585.00	2,778.00	1,500.00
22. Misc. metal work	15,700 lb.	.16	.182	.15
23. Electric conduit	400 lb.	.30	.40	.60
24. Light, power system	L. S.	400.00	200.00	265.00
25. Pump station superstr	L. S.	7,000.00	8,500.00	10,000.00

HARBOR DREDGING, OHIO

OWNER: U. S. Engineer Department, Col. J. A. O'Connor, District Engineer, Buffalo, N. Y.

PROJECT: Excavation of 406,000 c. y. material other than shale and of 277,800 c. y. shale, place measurement, in Conneaut Harbor, Ohio.

BIDS: Four bids were opened in July, 1937, ranging from $1,231,930 to $1,367,410.

LOW BIDDERS:

1. Merritt-Chapman & Scott Corp., New York, N. Y.	$1.231,930
2. Dunbar & Sullivan Dredging Co., Detroit, Mich.	1.270,394
3. Great Lakes Dredge & Dock Co., Cleveland, Ohio	1.284,284

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Material, not shale	406,000 c. y.	$0.40	$0.44	$0.44
2. Shale	277,800 c. y.	3.85	3.93	3.98

PIPE TUNNEL, MILWAUKEE

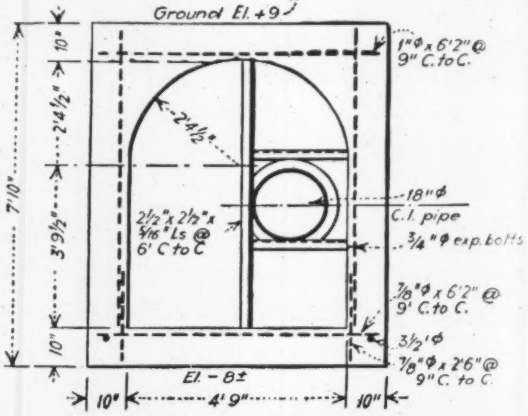
OWNER: Sewerage Commission of Milwaukee, Wisc., J. L. Ferebee, chief engineer.

PROJECT: Concrete-lined tunnel 270 ft. long, 4 ft. 9 in. wide, 6 ft. 10 in. high, inside dimensions, semi-circular arch, walls 10 in. thick of reinforced concrete. Tunnel to carry 18-in. cast iron sludge pipe, installed by contractor; project includes constructing waste sludge pipe line with valves and gates.

CONDITIONS: Located on Jones Island, Milwaukee. Tunnel to be driven through sand by poling board method about 400 ft. from river and below water level. Pumping will be required. Stipulated contract time four months. Typical wage rates: operator, $1.65; miner, form setter, $1.50; mucker, reinf. setter, $1.50; concrete laborer, 85c.

BIDS: Four bids submitted on July 8, 1937; range $33,470 to $49,500. Proposals were taken on lump sum basis, but after award of contract, successful bidder was required to submit a breakdown of expected costs to the Commission. Following is the breakdown submitted by F. A. Coll, Milwaukee, to whom the contract was awarded on July 15 for $33,470.

Item	Quan.	Unit Cost	Labor	Mat'l
1. Tunnel mining	270 l. f.	$30.00	$8,100	......
2. Concrete placing	270 l. f.	8.00	2,160	......
3. Laying pipe	500 l. f.	6.00	3,000	......
4. Breaking concrete wall	......	......	2,000	......
5. Open cut excavation	50 l. f.	40.00	2,000	......
6. Shaft lumber	......	......	......	$360
7. Tunnel lumber	240 l. f.	5.00	......	1,200
8. Concrete forms	270 l. f.	1.00	......	270
9. Reinf. steel	25,000 lb.	......	......	760
10. Cast iron pipe	36.5 ton	......	......	2,800
11. Lead and hemp	......	......	......	300
12. Pipe supports	......	......	......	500
13. Gate valves, sluice gates	......	......	......	1,000
14. Concrete materials	500 c. y.	8.00	......	4,000
15. Misc. & Overhead	......	......	......	4,020
Total costs	......	......	$17,260	$16,210



TYPICAL TUNNEL CROSS SECTION

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news

Smaller Buggy Model

A new 15-yd. pneumatic-tired buggy, very similar to their 24- and 30-yd. buggies, has been announced by R. G. Le Tourneau, Inc., of Peoria, Ill., and Stockton, Calif. The new buggy uses the same positive dumping method that has been used for the past four years in the larger buggies. In unloading, the body moves backward over the bed, pushing the load through an ever-widening opening to the rear, so that the wheels do not travel over the material as it is unloaded. The full extended opening is 7 ft., 10 in., by 9 ft., 10 in. Unloading takes less than a minute and can be accomplished while on the move.

The 15-yd. buggy is built primarily for use with shovels and draglines in material that is too hard for scraper loading. Maneuvering as a two-wheel cart, the buggy is unusually easy to spot, and its large body makes unnecessary careful spotting of the shovel or dragline bucket. It is built for use with Caterpillar RD-7 and RD-8 tractors and is cable-controlled by a single-drum power control unit.

The buggy is built of alloy steel, arc welded, with a wood-filled reinforced bottom.

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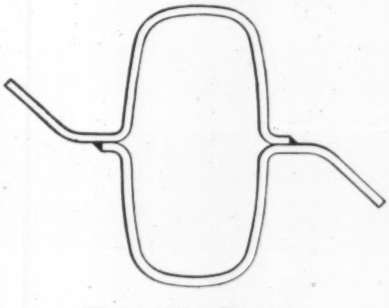
Heated Weigh Bucket For Bitumen

The Easton Car & Construction Co., of Easton, Pa., has developed a weigh bucket for use in bitulithic mixing plants, which employs an electrically heated valve. The valve is of the rotary sleeve type extending the entire length of the bucket.

A quarter turn of the handle opens the valve and permits the contents to spray over a wide area of the mixing tank, insuring an even coating of the stone. The material, as it flows from the bucket, passes over and around a heated pipe. The side walls of the bucket are also heated, which results in a clean discharge of each fill.

Although this device was designed for use in connection with the Easton-Clarmac electric system of heating bitumen, it is adaptable to any plant producing pre-mix preparations. It uses either a.c. or d.c. 110-volt current and requires no thermostatic devices.



New Pile Design

An unusual design of hollow pile developed by R. C. Springer of New York City involves the use of a parabolic shape with a small fin extrusion to permit of easier driving.

The pile can be driven open ended, in which case it may be left full to obtain maximum fixation or the pile may be cleaned out after driving and the surrounding soil consolidated by dropping concrete into the pile.

Pipe Is Coated On the Job

An interesting coating machine has been developed by Wailes Dove-Hermiston Corp. in connection with a new service it is offering under which the company will, under contract, do the field as well as the shop coating of its pipe.

Pipe passes through the coating machine in an endless stream. Each pipe is attached, by a special internal coupling, to a pipe already passing through the machine and is moved forward with a rotating motion by a positive drive. As the pipe passes through the driving mechanism it moves over a tank containing hot bitumastic enamel provided with burners to keep the melted enamel warm. As the pipe passes over the tank it passes under a wide coating nozzle. Hot enamel is pumped from the tank into the nozzle and issues from it in a wide ribbon onto the revolving pipe. A fabric spreader helps distribute the coating on the outside of the pipe surface.

Beyond the point of application, the coated pipe passes through a water spray to accelerate the cooling of the coating.

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Eight transmission-controled digging speeds are available, ranging from 22 to 98 in. per minute. Eight more speeds are available by moving a feather-keyed sprocket into position and adjusting the chain. Another sprocket is furnished which further increases the digging range, giving a top speed of 23 ft. per minute. The machine will dig up to 5½ ft. deep in a trench from 15 to 22 in. wide.

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(*Contract Unit Prices continued from page 488*)

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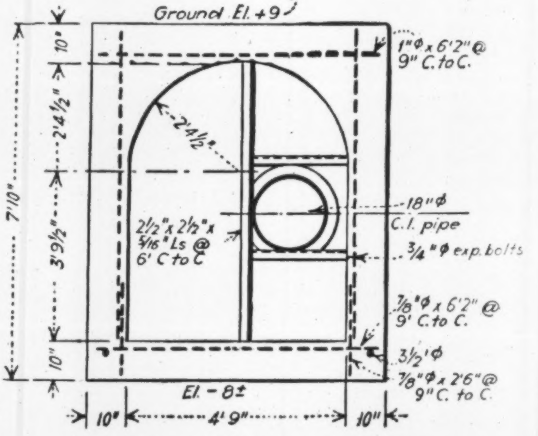

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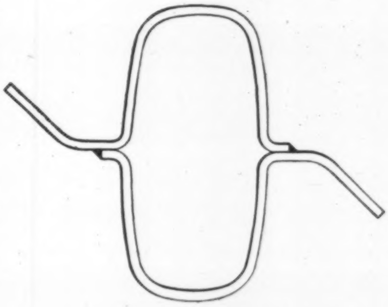

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EQUIPMENT IN BRIEF

Welding Goggles especially made for those who have to wear glasses constantly have been developed by The Linde Air Products Co. of New York City. The goggles, known as Coverall, are made of strong light non-inflammable material and are furnished with green lenses.

A Wire Twister for wiring up concrete reinforcing bars and for tying paper or cloth bags, is furnished by Montgomery & Co., Inc., of New York City. The device is operated by inserting a hook into the loop of the wire and pulling a handle along a threaded rod fastened to the hook. The tool sells for $3.

The Constant weight feeder manufactured by the Hardinge Co. of York, Pa., now incorporates a standard magnetic pulley to remove such substances as tramp iron and steel from materials to be fed from a bin to units such as grinding mills, dryers, mixers and kilns.

The Through-Wall flashing line of the American Brass Co. of Waterbury, Conn., has been supplemented with new one-piece inside and outside corner flashings for 8 in. and 12 in. walls. These corner flashings are designed so that the corrugations will interlock with those of adjoining straight flashings, eliminating soldered miter joints or bulky laps.

Salt in tablet form for the prevention of heat-sickness is dispensed by the new M. S. A. salt tablet dispenser manufactured by the Mine Safety Appliances Co. of Pittsburgh. The dispenser may be operated with one hand and deposits one tablet directly in the palm. Due to its waterproof construction, the dispenser is recommended for outdoor use wherever hot working conditions exist. Complete with 250 tablets, it sells for $5.

A Skid-Proof floor varnish, Warcote, is being manufactured by the Warren Refining & Chemical Co. of Cleveland. The new finish gives a bright, waxlike appearance suitable for either home or industrial use but at the same time is skid-proof and is not injured by hot water or mild soap solutions.

Separate voltage and amperage controls, enabling the operator to select the most desirable voltage for the amperage used on any job, are provided on an a-c welder recently put on the market by the Miller Electric Mfg. Co., Appleton, Wisc. This welder, known as "dual control" furnishes practically unlimited current settings. It is built in three sizes with a current range that makes possible welding of both sheet and heavy metal. List prices are $210, $240, and $315.

Caterpillar Tractor Co. has announced a new model, No. 33, blade grader suitable for use with tractors of about 35 drawbar horsepower. It is equipped with a standard 8-ft. blade, weighs 5,900 lb., and is similar in general design to the Caterpillar graders Nos. 44 and 66 recently added to the line.

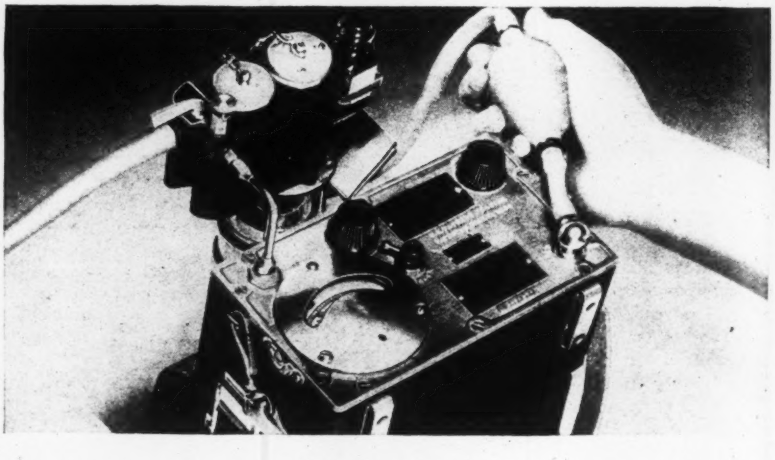
A Less Expensive C. M. C. plaster and mortar mixer, the Wonder, is furnished on two rubber tired wheels complete with a 3½-hp. Stover engine by the Construction Machinery Co., Waterloo, Ia., at $295. Features include a streamlined welded steel one-piece trailer frame, cantilever springs, 6-cu. ft. drum, triple mixing hoes, and self-aligning hoe shaft bearings.

Increased Power, nearly 50 per cent greater, is incorporated in the new model 2A-2X Hydrauger horizontal driller for underground pipe installation manufactured by the Hydrauger Corp. of San Francisco. The new model will bore any size hole from 2½ to 14½ in. Increased portability is provided by the shorter frame which permits handling by two men, and the stronger air motor and more rigid frame increase the durability of the machine.

A Traffic Signal time switch, which is considerably smaller than other approved time switches, is the Sauter time switch, Type SY, manufactured by R. W. Cramer & Co., of New York. The switch can be mounted in any position, on an angle or sideways, and can be set accurately to within 30 seconds. The housing is weatherproof and a latch is provided for a small padlock. The motor is a self-starting, slow-speed synchronous motor which turns a 24-hour dial and its program setting levers through a rugged gear train. A hand-operated knob makes it convenient to open and close the contact manually without interfering with the normal sequence of its operation.

A Pipe Vise which can be tightly locked to any column, pillar or post up to 10 in. in diameter, has been developed by the Armstrong Mfg. Co. of Bridgeport. The vise can be fastened to any post by looping a chain around the post and drawing it up with the locking handle. Two types are manufactured, the No. 152 Armstrong side-open post vise which holds pipe from ⅛ to 2 in. in diameter, and the No. 163 hinged post vise which holds pipe from ⅛ to 2½ in. Both models are equipped with a ¾ in. pipe bender.

A One-way reversible-blade snow plow has been developed by J. D. Adams Co. of Indianapolis for use with the Adams No. 20 motor grader announced last fall. The plow is hydraulically controlled from the cab.



Gas Indicator

A new line of gas indicators which will detect the presence of poisonous or explosive gases has been announced by The Linde Air Products Co. of New York City. They are known as the UCC gas indicators.

The UCC all-service indicator, Model B-1, will indicate the presence of combustible gases, indicate an oxygen deficiency, and in addition will determine the presence of carbon monoxide and hydrogen sulphide in dangerously toxic concentrations. A graduated meter scale indicates by direct reading whether combustible gases are present and whether concentrations are above, within, or below explosive limits.

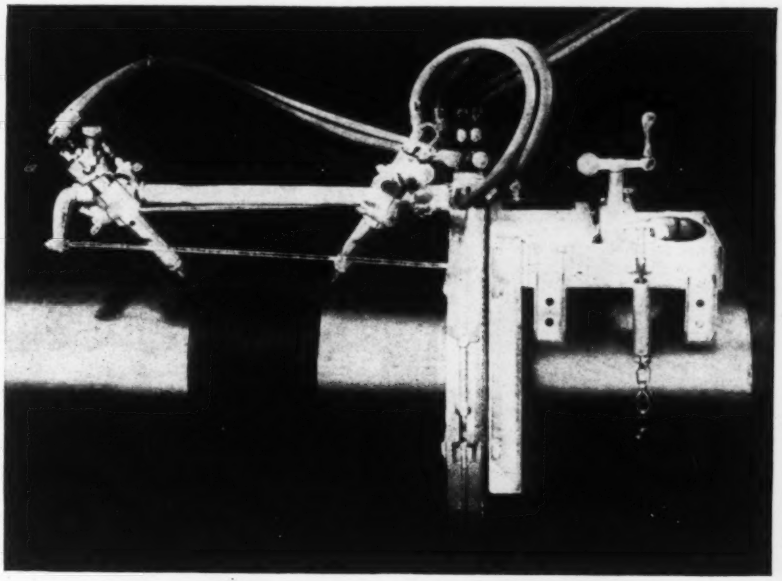
A model is also available, model 12-B, which will only indicate the presence of combustible gas.

Small Brick Houses

A series of plans for small brick houses designed to be built at a cost of from $3,000 to $4,500, has been issued by Structural Clay Products Institute. These houses have been planned from the principles outlined in Technical Bulletin No. 4 of the Federal Housing Administration, and are the same demonstration types which are being built throughout the country in frame construction under the auspices of the National Lumber Manufacturers Association.

A booklet issued by the Structural Clay Products Institute indicates three methods of building the exterior walls for these houses. The foundations can be constructed of hollow clay tile or brick. Exterior walls can be built of brick with hollow clay tile backing or solid brick, as selected. Also, in many cases, these houses will be built of brick veneer construction.

The institute states that under FHA-insured financing the additional cost of building these houses with brick exteriors represents only about $2 per month added to the monthly payment.



Pipe Cutting and Beveling

Beveling and cutting of 8-, 10- and 12-in. pipe preparatory to gas welding is accomplished by the oxyacetylene flame in the new oxweld CM-13 pipe cutting machine recently developed by The Linde Air Products Co. The machine can be operated by one man.

The channel ring which fits around the pipe can easily be fastened to and removed from the pipe. Channel ring and blow pipe can rotate around the entire circumference of the pipe in one cut. The ring is driven during the cutting operation by enclosed gears which can be released by means of a friction clutch for hand rotation of the channel ring. At the finish of a cut the severed section of pipe falls free without interfering with any parts of the machine.

A detachable valve body on the channel ring permits quick disconnecting and attaching of the supply hose.

Provision is made for the use of an additional blow pipe on the tube extension arm, as is shown in the illustration. This makes the CM-13 adaptable to double cutting and beveling.

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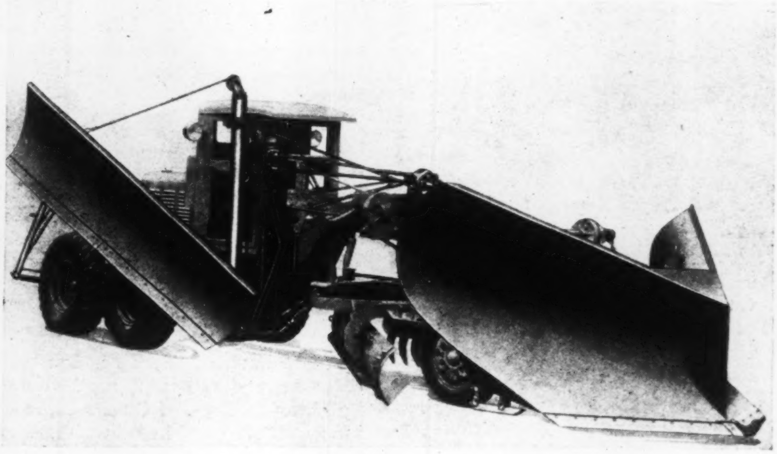


Streamline Snow Plow

A new streamlined snow plow and a new snow wing have just been announced by J. D. Adams Co. of Indianapolis. The new units are intended for use on Adams motor graders Nos. 301, 151, 50 and 51. They are shown mounted on the No. 51 powered by a 62 hp. diesel engine.

The snow plow has been designed to give a maximum throw of light snow at high speed and to move heavy snow with a minimum of power. The plow is 3 ft. 6 in. high in front and 6 ft. high at the rear. The curvature lifts the snow as much as 5 ft. before throwing it out, so that the snow is actually lifted up and thrown out over the top of even quite deep surrounding snow.

The new snow wing, which is 12 ft. long and flares from 31 to 36½ in. wide, is independently adjustable for height at both ends. It may be set horizontally to move light snows outward as much as 10 ft. or it may be angled at a height to deliver snow on top of a 10 ft. bank.

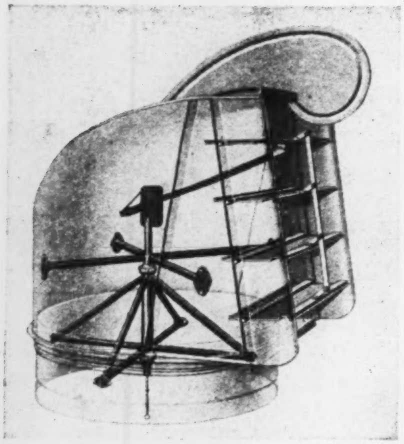
Both snow plow and snow wing are power-controlled, utilizing the regular power outlets at the standard power control box furnished with each grader. The plow may be purchased and used without the wing, but the wing should only be used with the plow.

New Waterworks Concern

A new organization to manufacture specialties in the waterworks field has been organized by James E. Williamson, Jr., for many years a representative of the Rensselaer Valve Co. The new concern, known as Hanson-Williamson, Inc., is in Elmont, L. I., N. Y.

Hanson-Williamson will manufacture the Selecto valve and other devices developed and manufactured by the late James E. Williamson, and will also manufacture the Flow-O-Meter and specialties for Northrop & Cook Co.

Besides its manufacturing activities in the waterworks field, the new concern will be agents on Long Island for Rensselaer Valve Co.



Rotary Roof Ventilator

A new rotary roof ventilator for industrial and commercial building application which offers many improved detail features over their previous model has been developed by the Swartwout Co. of Cleveland.

The chief improvement is the new stainless steel fully enclosed and dust-tight oilless ball bearings on which the head turns with the wind. The interior construction is of streamlined steel tubing welded into a one-piece frame.

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Steel in Technicolor

A full-length sound movie, in technicolor, illustrating the manufacture of steel, is being made by Technicolor, Inc., for the U. S. Steel Corporation. The film will cost more than $200,000 to produce and will show scenes from 20 steel plants.

The movie will include scenes on the iron range at Hibbing, Minn., and the oredocks at Duluth, furnace operations at Gary, and at the south Works of Carnegie Steel Corp. Bessemer convertors will be photographed in Chicago, and at the Waukegan and Joliet works of the American Steel & Wire Co. pictures will be made of the manufacture of wire fence, nails and similar products.

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Non-Shrinking Mortar

Mortite, a product of The Truscon Laboratories, Detroit, is a liquid which, when added in very small quantities to brick mortar, makes it very workable. This great workability makes it possible to use less water in the mortar and as a result there is less shrinkage. Mortar made with Mortite, it is said, does not pull away from the brick or stone and does not develop shrinkage cracks or checks. Efflorescence also is reduced.

NEW PUBLICATIONS

A Small pipe repair handbook tells how to repair leaks quickly without taking pipe lines out of service by the use of Skinner-Seal pipe clamps.—M. B. Skinner Co., South Bend, Ind.

Forms and Instructions for surveys of industrial wiring in any plant are bound into a booklet, "Industrial Wiring Survey."—Anaconda Wire & Cable Co., New York City.

A Discussion of the uses and characteristics of measuring instruments used in the chemical treatment of sewage is included in a very handsomely printed booklet, Bulletin 287.—Builders Iron Foundry, Providence.

The Tenth Edition of the "American Pipe Manual" contains 200 pages bound in a plastic binding, which permits the pages to lie flat, between flexible leather covers. This latest edition covers several products now listed for the first time.—American Cast Iron Pipe Co., Birmingham.

The Manner in which workable concrete mixes may be obtained with less water by the use of Pozzolith is pointed out in a booklet, "Less Water—Yet More Placeability."—Master Builders Co., Cleveland.

Adams leaning wheel graders are shown in a revised 34-page catalog.—J. B. Adams Co., Indianapolis, Ind.

"The Fisher Line of Building Specialties" is a loose-leaf catalog.—Fisher & Hayes Rope & Steel Co., Chicago, Ill.

Accessories for larger portable material-producing plants are cataloged in the 16 pages of Plant Accessory Bulletin No. X-1. Included are such items as screens, conveyors, bins, buckets and feeders.—Iowa Manufacturing Co., Cedar Rapids, Iowa.

Specifications for Douglas fir plywood are covered in detail in the new Pamphlet 16 of the Lumber Grade-Use Guide. The 12-page leaflet describes the product, its method of manufacture and its inspection under the Douglas Fir Plywood Association rules. A glossary of terms and abbreviations and a brief table of recommended uses, with the grades recommended for best services, and a table of the various thicknesses of plywood commonly used for special purposes are included.—National Lumber Manufacturers Association, Washington, D. C.

The Brownhoist Line of diesel locomotive cranes, ranging in capacity from 10 to 50 tons, is described in a new bulletin. The cranes are shown in pictures doing all kinds of bucket and magnet work, and the more important features of their construction are pointed out in the text.—Industrial Brownhoist Corporation, Bay City, Mich.

"Taste and Odor Control with Activated Carbon" is the fairly descriptive title of a new 80-page pamphlet on the use of Aqua Nuchar. The booklet appears to contain a great deal of detailed and practical information on methods of application of the carbon.—Industrial Chemical Sales Division, West Virginia Pulp & Paper Co., New York City.

A New Pocket-Sized catalog covers in 98 pages 14 types of motorized speed reducers (ratio motors), and 14 types of mechanical speed reducers (reductors), with a new line of miter gear units, engineering data on the selection of equipment, and a line of flexible couplings. The motorized units range in capacity from 1/20 of a horsepower to 3 hp.—Austin Gear Works, Inc., North Quincy, Mass.

In Case you want to know "How to Buy Culverts," U. S. Steel has put out a 22-page booklet handsomely printed in two colors. Design tables for corrugated culverts are included.—United States Steel Corp. Subsidiaries, Pittsburgh.

A Wall Chart, 12½ x 18 in., contains recommended standard sizes, manufacturing tolerances, and sections of standard spring washers. It is intended to be hung in engineering offices and drafting rooms.—National Lock Washer Co., Newark, N. J.

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Pressure Distributor

A new addition to the Littleford line of pressure distributors, manufactured by Littleford Bros. of Cincinnati, is the Model "TS" furnished in sizes from 500 to 2,000 gal. for truck or trailer mounting. The new model will handle all types and grades of road bitumen for heavy construction work.

The heating system consists of two large torch burners furnishing sufficient heat to raise the temperature of the tankfull of material 3 deg. F. per min. A 300-gal. Viking rotary gear-type pump and a fifth-wheel tachometer gage the application accurately, and a patented bypass built into the pump assures proper application pressure.

The operator's platform is placed high enough to keep him out of the smoke and fog and permit him to see both sides of the road. A fuel pump on the engine provides the correct amount of kerosene to the burners.

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CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

EARTH IRRIGATION DAM, NEB.

OWNER: Central Nebraska Public Power & Irrigation District; Geo. E. Johnson, Chief Engineer, Hastings, Neb.

PROJECT: Construction of Middle Diversion Dam of Tri-County Project for Central Nebraska Public Power and Irrigation District, including dikes, canals, intake and head gates, and all appurtenant items.

BIDDERS: Six bids were opened in July, 1937, ranging from $27,249 to $35,213. The contractor furnishes all labor and materials required in the construction.

LOW BIDDERS:

1. Zybach and Sokol, Columbus, Nebr.	$27,249
2. Inland Construction Co., Omaha, Nebr.	28,781
3. John W. Towle, Omaha, Nebr.	31,036

		Unit Prices		
Item	Quan.	(1)	(2)	(3)
1. Pumped fill, dikes	40,000 c. y.	$0.15	$0.14	$0.17
2. Canal excav	65,000 c. y.	.115	.10	.14
3. Structure excav	400 c. y.	.50	.60	2.00
4. Puddled backfill	30 c. y.	1.00	.60	2.00
5. Backfill, compacted	80 c. y.	1.00	.70	2.00
6. Apron subgrade	164 c. y.	1.00	1.50	2.00
7. Wood sheetpiling	14,200 s. f.	.45	.70	.57
8. Untreated timber	58 M.b.m.	90.00	88.00	61.00
9. Misc. iron	3,350 lb.	.10	.12	.10
10. Deadman assemblies	16 ea.	5.00	10.00	6.00
11. Hand hoists, 5 ton	1 ea.	150.00	140.00	100.00
12. Clearing	2.5 acre	200.00	50.00	325.00
13. Grubbing	2.5 acre	250.00	100.00	325.00

HEART MOUNTAIN CANAL, WYO.

OWNER: U. S. Bureau of Reclamation, Cody, Wyo.

PROJECT: Construction of earth work, lining and structures for the Heart Mountain Canal of the Shoshone project near Cody, Wyo. The work extends over a 7½-mile stretch, with the earth sections approximating 30 ft. in bottom width and 1½:1 sloped embankments rising 10 ft. The lined section, extending 2,000 ft., has a 7-ft. bottom width, and a 4-in. concrete lining sloping 1¼:1 to a 7½-ft. height.

BIDS: Four bids were opened August, 1937, ranging from $224,553 to $237,879. Completion is scheduled for 350 days; minimum hourly wages stipulated at $1.20 for skilled and 50c. for common labor, and the government furnishing f.o.b. Cody, Wyo., all cement, admixtures, reinforcing steel, concrete pipe for turnouts, sewer pipe, gates and gate hoists, valves, metalwork, and all miscellaneous materials entering into the completed project other than aggregates, backfill and items of construction required in the forming and prosecution of the work.

LOW BIDDERS:

1. James Crick, Spokane, Wash.	$224,553
2. Morrison-Knudsen Co., Inc., Boise, Idaho	228,603
3. Taggart Const. Co., Cody, Wyo.	237,879

		Unit Prices		
Item	Quan.	(1)	(2)	(3)
1. Canal excav., common	685,000 c. y.	$0.10	$0.092	$0.10
2. Canal excav., rock	98,500 c. y.	.10	.092	.25
3. Overhaul	26,500 c. y.	.02	.02	.02
4. Struct. excav., common	11,800 c. y.	.20	.30	.60
5. Struct. excav., rock	650 c. y.	1.00	.75	1.00
6. Channel, dike excav. common	20,000 c. y.	.20	.12	.12
7. Channel, dike excav., rock	100 c. y.	1.00	.80	1.00
8. Compact embankment	44,500 c. y.	.10	.16	.15
9. Prepare rock fdt. for conc	2,350 s. y.	.40	.50	.50
10. Trim earth fdt. for conc	5,720 s. y.	.20	.30	.25
11. Structure backfill	26,600 c. y.	.20	.15	.15
12. Puddle, tamp backfill	11,300 c. y.	.25	.45	.40
13. Structure concrete	4,750 c. y.	18.00	19.50	16.00
14. Concrete canal lining	900 c. y.	14.25	12.00	15.00
15. Place reinforcing steel	1,115,500 lb.	.02	.02	.02
16. Dry rock paving	970 s. y.	1.00	2.00	2.00
17. Erect. struct. timber	9 M.b.m.	35.00	30.00	30.00
18. Uncmt'd. jt. drains, 6-in	1,850 l. f.	.30	.50	.50
19. Lay cmt. jt. drain, 6-in	400 l. f.	.40	.50	.40
20. Lay concrete pipe, 18-in	260 l. f.	.90	.85	.40
21. Lay concrete pipe, 24-in	40 l. f.	1.00	1.50	.50
22. Install valves, connections	4,000 lb.	.05	.05	.05
23. Install pipe handrails	1,730 l. f.	.05	.07	.05
24. Install gates, hoists	11,950 lb.	.05	.05	.05
25. Install stop plank guides	1,820 lb.	.05	.07	.05

RAILROAD VIADUCT, SAN FRANCISCO

OWNER: Dept. Public Works, California; C. H. Purcell, Chief Engineer.

PROJECT: Construction of concrete railroad viaduct in connection with the San Francisco-Oakland Bridge, California.

BIDS: Six bids were opened in August, 1937, ranging from $605,350 to $733,337, with the contractor furnishing all materials and labor, and minimum hourly wages stipulated of $1.66 for skilled and 75c. for common labor.

LOW BIDDERS:

1. Eaton & Smith, San Francisco, Cal.	$605,350
2. Bates & Rogers, Const. Co., Oakland, Cal.	651,607
3. Clinton Const. Co., San Francisco, Cal.	670,854

		Unit Prices		
Item	Quan.	(1)	(2)	(3)
1. Demolition, buildings	L. S.	$2,600.00	$3,700.00	$5,900.00
2. Excavation unclass.	20,000 c. y.	1.18	.50	.53
3. Excav. struct	15,000 c. y.	2.36	2.80	3.80
4. Cut piles	50 ea.	4.00	7.00	2.00
5. Timber piles	45,000 l. f.	.73	.615	.58
6. Concrete piles	10,000 l. f.	3.12	2.65	2.75
7. Concrete, foundations	4,500 c. y.	7.50	10.00	9.40
8. Concrete, superstruc	12,500 c. y.	15.30	19.85	20.00
9. Extra Portland cement	2,500 bbl.	2.32	1.95	2.00
10. Conc. deck, steel spans	1,400 c. y.	21.80	21.45	20.00
11. Reinforcing steel	3,300,000 lb.	.05	.0458	.049
12. Misc. steel work	100,000 lb.	.10	.185	.09
13. Bronze exp. plates	4,200 lb.	.50	.51	.37
14. Pipe railing	100,000 lb.	.17	.168	.175
15. Waterproof deck	L. S.	7,600.00	6,470.00	7,000.00
16. Drainage	L. S.	12,080.00	14,400.00	17,300.00
17. Street work	L. S.	4,400.00	3,800.00	4,300.00

WHARF SHEDS, CORPUS CHRISTI

OWNER: Nueces County Navigation District; Robt. J. Cummins, Engineer.

PROJECT: Construction of wharf, 650x180 ft., of reinforced concrete and treated timber piles; frame shed, 120x350 ft., corrugated iron sides and roof; shed, addition to Wharf No. 9, 120x160 ft., corrugated iron sides and roof; railroad tracks and spurs; all located at north side of turning basin, Corpus Christi Bay, Texas.

BIDS: Nine bids were opened June, 1937, ranging from the contract low of $341,200 to $442,000, with completion scheduled for 165 days after contract award, minimum hourly wages stipulated of $1.875 for skilled and 45c. for common labor, and contractor furnishing all the materials required in the construction. Following unit prices are a breakdown furnished by fourth bidder, principal items only included. Bids were called for on lump sum basis.

LOW BIDDERS:

1. A. J. Rife Construction Co., Dallas, Texas (contract)	$341,200
2. Brown & Root, Corpus Christi, Texas	352,000
3. H. B. Zachry, Laredo, Texas	360,630

4. McKenzie Const. Co., San Antonio, Texas.... 368,942

BREAKDOWN OF PRINCIPAL QUANTITIES AND UNIT PRICES

(Fourth low bidder.)

1. Concrete, Cl. A	5,280 c. y.	$8.50
2. Concrete, Cl. AA	3,860 c. y.	8.50
3. Forms	28,000 s. f.	.22
4. Reinforcing steel	60,000 lbs.	.0425
5. Creosoted piling, 22 ft	6,600 l. f.	1.45
6. Creosoted piling, 12 ft	1,800 l. f.	1.25
7. Creosoted lumber, 12 ft	16 Mfb.m.	110.00
8. Riprap	3,200 ton	3.00
9. Caliche	1,800 ton	1.90
10. Uvalde rock asphalt	8,000 s. y.	.60
11. Fill	12,000 c. y.	.45
12. Sprinkler heads	80 ea.	5.00
13. Cast iron pipe, 8 in	3,200 l. f.	2.00
14. Gal. iron, 8 ft. square	86 ea.	3.40

MISSOURI RIVER DIKES, IOWA

OWNER: U. S. Engineer Dept.; Capt. H. B. Loper, District Engineer, Omaha, Neb.

PROJECT: Construction of 16,970 lin. ft. standard dikes and 4,355 lin. ft. of abatis in the Missouri River at Little Sioux-Bullard Bends.

BIDS: Seven bids were opened in July, 1937, ranging from the contract low of $371,627 to $411,106, based on the contractor furnishing all materials and minimum hourly wages of 82½c. for skilled and 50c. for common labor. At the point of construction the channel is changeable, with swift current and mud and sand bottom.

LOW BIDDERS:

1. A. W. Farney, Inc., Kansas City, Mo. (contract) $371,627
2. W. P. McGeorge, Pine Bluff, Arkansas...... 399,056
3. Massman Const. Co., Kansas City, Mo...... 400,719

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Lumber mattress, fabric	380 sq.	$5.50	$8.00	$7.50
2. Lumber mattress	14,280 sq.	7.60	7.40	7.50
3. Mattress, dike stone	19,200 ton	3.10	3.60	3.50
4. Hand paving stone	1,330 ton	5.50	4.50	5.00
5. Paving spalls	650 ton	3.10	3.50	3.60
6. Piles, stringers, braces	383,200 l. f.	.472	.52	.518
7. Abatis mattress	870 sq.	5.50	8.00	7.50
8. Mattress stone abatis	520 ton	4.00	3.70	3.75
9. Abatis timbers	47,000 M.b.m.	.08	.08	.10
10. Wire fabric screening	700 sq.	2.20	3.00	3.00
11. Deadmen	220 ea.	5.00	4.00	3.80

RUBY DAM, SEATTLE

OWNER: Board Public Works, Seattle, Wash.; J. D. Ross, Engineer.

PROJECT: Construction of 150-ft. high concrete arch dam on Ruby Creek, Skagit River near Ruby, Wash.

BIDS: Contract was awarded based on receipt of one bid only in July, 1937, of $3,967,785, with completion scheduled for June, 1939. Seattle minimum hourly wages prevail. The owner furnishes cement, awarded at $529,767, and the mechanical equipment required in the dam operation.

LOW BIDDERS:

1. General Construction Co., Seattle, Washington, Columbia Construction Co., Bonneville, Ore., and J. F. Shea, Portland, Ore., combined (contract) $3,967,785

The contract for cement was awarded to Superior Portland Cement Co., Seattle, Washington, in the amount of $529,767.

Item	Quan.	Unit Prices
1. River diversion	L. S.	$700,000.00
2. Rock excav. above el. 1,180	80,000 c. y.	5.00
3. Rock excav., el. 1,050 to 1,180	100,000 c. y.	5.40
4. Rock excav. below el. 1,050	5,000 c. y.	10.00
5. Common excav. above el. 1,180	2,000 c. y.	3.00
6. Common excav. below 1,180	42,000 c. y.	3.00
7. Rock excav. bypass tunnel	15,000 c. f.	1.20
8. Rock excav. adit	19,000 c. f.	.50
9. Grout holes, 1½ in. to 30 ft	1,500 l. f.	3.00
10. Grout holes, 1½ in. to 50 ft	5,000 l. f.	3.00
11. Grout holes, 1½ in. to 100 ft	800 l. f.	3.00
12. Grout holes, 1½ in. to 150 ft	1,000 l. f.	3.00
13. Grout holes, 1½ in. to 500 ft	1,500 l. f.	3.00
14. Black welded steel pipe, 1½ in	2,000 l. f.	.49
15. Black welded steel pipe, 2 in	200 l. f.	.60
16. Black welded steel pipe, 2½ in	500 l. f.	.80
17. Black welded steel pipe, 3 in	3,800 l. f.	1.00
18. Valves, fdt. grt. pipe, 1½ in	10 ea.	10.00
19. Valves, fdt. grt. pipe, 2 in	10 ea.	15.00
20. Valves, fdt. grt. pipe, 2½ in.	10 ea.	15.00
21. Valves, fdt. grt. pipe, 3 in.	10 ea.	35.00
22. Fdt. pressure grouting	1,000 c. f.	3.00
23. Pressure grouting, bypass tunnel	250 c. f.	4.00
24. Drainage holes to 50 ft	3,000 l. f.	4.00
25. Drainage holes to 100 ft	500 l. f.	4.00
26. Drainage holes to 150 ft	500 l. f.	4.00
27. Blk. welded steel pipe, dam fdt., 3 in.	500 l. f.	1.00
28. Blk. welded steel pipe, dam fdt., 4 in.	8,000 l. f.	1.30
29. Porous conc. drain, 8 in	2,300 l. f.	1.00
30. Porous conc. drain, 20 in. split	1,200 l. f.	4.00
31. Concrete, Cl. A	235,000 c. y.	6.75
32. Concrete, Cl. A, galleries	6,000 c. y.	6.75
33. Concrete, Cl. B	30,000 c. y.	6.75
34. Concrete, Cl. C	1,000 c. y.	20.00
35. Concrete, Cl. D	600 c. y.	20.00
36. Concrete, Cl. A, bypass tunnel	3,000 c. y.	20.00
37. Concrete, Cl. E	600 c. y.	6.75
38. Admixtures	6,000 lb.	.10
39. Copper water seals, 15 in	3,000 l. f.	2.00
40. Copper water seals, 10 in	17,000 l. f.	1.50
41. Galv. iron grt. stops	2,500 l. f.	1.00
42. Gal. stl. pipe, ½ in., grt. contraction	15,000 l. f.	.20
43. Gal. stl. pipe, 1½ in. grt. contraction	6,500 l. f.	.40
44. Valves, 1½ in. grt. contraction jts	60 ea.	10.00
45. Galv. grout units	1,300 ea.	1.50
46. Reinforcing steel	300,000 lb.	.07
47. Install gates, hoists, trash racks, etc	50,000 lb.	.05
48. Install butterfly valves, 60 in. (2)	40,000 lb.	.05
49. Install bypass tunnel steel pipe	600,000 lb.	.06
50. Anchor holes, bars, hangers	200 l. f.	3.00
51. Anchor bars, hangers	500 lb.	.20
52. Metal conduit, sherardized, to 1¼ in	1,000 l. f.	.50
53. Metal conduit, sherardized, to 3 in	1,000 l. f.	1.00
54. Metal conduit, sherardized, 3½ in	500 l. f.	2.00
55. Elec. metal panel, pull boxes, over 10½ in	1,000 lb.	.50
56. Elec. wiring, to No. 12 A. W. G	3,000 l. f.	.10
57. Elec. wiring, to No. 8 A. W. G	1,500 l. f.	.20
58. Lamp bases, outlet boxes, 125 volt	25 ea.	2.00
59. Plug receptacles, 125 v. s. p	10 ea.	3.00
60. Plug receptacles, 30 amp., 3 ph., 250 volt	10 ea.	3.50
61. Cable, resist. thermometers, strain, jt. meters	7,500 l. f.	.20

EARTH FILL RESERVOIR, CALIF.

OWNER: City of Ventura, Calif.; C. Froerer, Engineer.

PROJECT: Construction of earth embankment type reservoir for water power purposes in the City of Ventura, Calif.

BIDS: Twenty-three bids were opened in August, 1937, ranging from $70,498 to $104,329. Alternative proposals were also submitted on different types and sizes of sump, gate valves, and concrete pipe, upon which basis the contract was awarded at $71,037, with the contractor furnishing all materials and minimum city wages prevailing.

LOW BIDDERS:

1. Minnis & Moody, Los Angeles, Calif........ $70,498
   Alternative 71,540
2. J. P. Immel, Ventura, Calif................. 70,514
   Alternative (contract) 71,037
3. C. F. Robbins, Los Angeles, Calif........... 73,937
   Alternative 74,424

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Reservoir excav	80,700 c. y.	$0.19	$0.18	$0.187
2. Rolled embank	19,000 c. y.	.30	.125	.097
3. Subgrading	19,500 c. y.	.07	.05	.13
4. Rein. conc. surface	19,400 s. y.	1.17	1.15	1.10
5. Slab reinforcing	281,000 lb.	.05	.06	.06
6. Structural concrete	206 c. y.	20.00	22.00	18.00
7. Misc. steel	18,000 lb.	.06	.06	.06
8. Reinf. conc. pipe, 36 in	488 l. f.	6.20	7.00	7.30
9. Reinstall Martin gate valve	L. S.	25.00	30.00	260.00
10. Redwood lumber	6M.b.m.	125.00	90.00	126.00
11. Weep holes	234 ea.	.75	.50	1.04
12. Gate valve, 24 in	L. S.	250.00	250.00	903.00
13. Reinf. conc. pipe, 24 in	24 ft.	4.00	4.00	13.00
14. Reinf. conc. pipe, 20 in	197 ft.	3.50	5.40	5.50
15. Screens	2 ea.	25.00	20.00	23.00
16. Reservoir sump	1 ea.	15.00	50.00	19.00
17. C. I. drain pipe, 8 in	96 ft.	2.00	4.25	4.50
18. Gate valve, 8 in	1 ea.	30.00	35.00	59.00
19. Concrete pipe, 8 in	397 ft.	.35	2.75	7.50
20. Reinstall fence	415 l. f.	.24	.25	.29
21. New fence	1,025 l. f.	.60	.60	.68
16A. Reservoir sump	1 ea.	50.00	60.00	100.00
18A. Gate valve, 16 in	1 ea.	150.00	75.00	414.00
19A. Reinf. conc. pipe, 16 in	493 l. f.	2.55	4.00	7.00

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"The Lightweight Pumping Champion of the World"

The PUMP of a hundred uses . . . runs anywhere . . . lifts 28 feet

Here's a complete self priming pumping outfit — weighing but 82 pounds — that will handle up to 8000 gallons per hour in practically any kind of service with a guaranteed suction lift of 28 feet. One man can carry it to the job and set it up quickly. It is very rapid in self-priming — from 5 to 50 seconds depending on suction lift.

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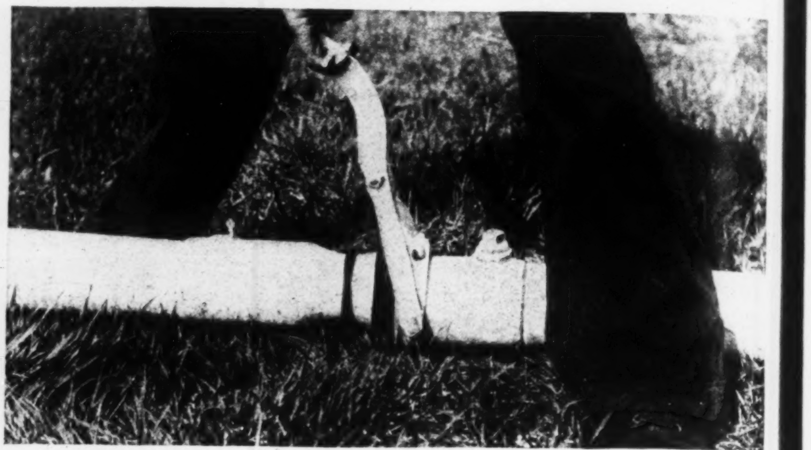
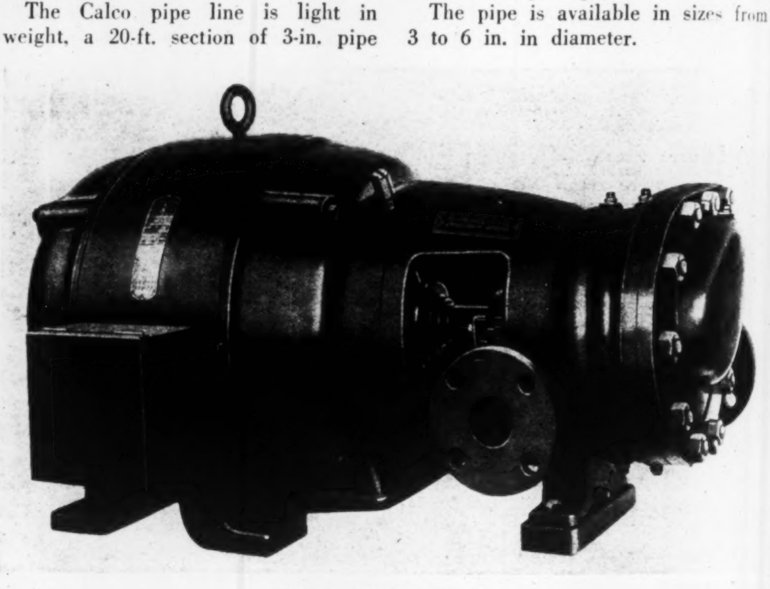


Quick Acting Coupling

A portable pipe line for air, gas, oil or water incorporating a quick-acting coupling by which pipes may be fastened together by simply throwing a lever, is being manufactured by the California Corrugated Culvert Co. of Berkeley, Calif.

The Calco pipe line is light in weight, a 20-ft. section of 3-in. pipe weighing only 53 lb., but will handle air pressures up to 80 or 100 lb. It is recommended by the manufacturer for such uses as header pipe operating from an air compressor on railroad ballast-tamping work and for water delivery on paving jobs.

The pipe is available in sizes from 3 to 6 in. in diameter.



High Head Pump

A two-stage pump with the pump and motor built together has been developed by Fairbanks, Morse & Co. of Chicago for operation against heads as high as 500 ft. It is intended as a less expensive alternative to multi-stage and split-case pumps and also for portable and semi-portable work. It is compactly designed for uses where space is limited. No special foundation is required, and the pump is complete in itself and may be mounted in any convenient horizontal, vertical or angular position.

The new unit consists of a two-stage centrifugal pump with enclosed bronze impellers, mounted directly on the shaft of an F-M splash-proof motor. Two ball bearings take all of the radial and unbalanced thrust loads, and the impellers for the two stages are placed back to back, compensating thrust.

Road Machinery Exhibit

What is expected to be one of the largest exhibits of roadbuilding machinery ever held will take place next year in Holland in connection with the world congress. As import controls are at a minimum in Holland, it will be possible for manufacturers all over the world to exhibit, which is now unusual in European exhibits.

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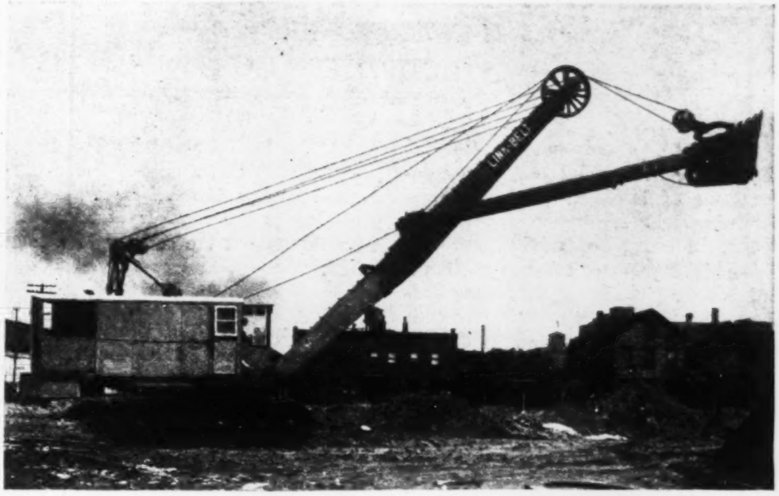
Cement Waterproofer

The Reardon Color & Chemical Works of Cincinnati has developed a process for making calcium stearate, widely used in cement manufacture for waterproofing cement, in bead form. The Reardon process of making calcium stearate is said to increase the content of true calcium stearate to 95.1 per cent, higher than in the powdered form. There is a reduction of about 25 per cent in price.

The beads, (about ⅛ in. in diameter and very irregular in shape, are fed into the grinding mill with the cement clinker. The irregular shape makes the beads tend to move along with the clinker and disperse more uniformly. The dustless character of the beads adds to operating cleanliness and convenience.



Lincoln Electric Co. photo

Welded Shovel

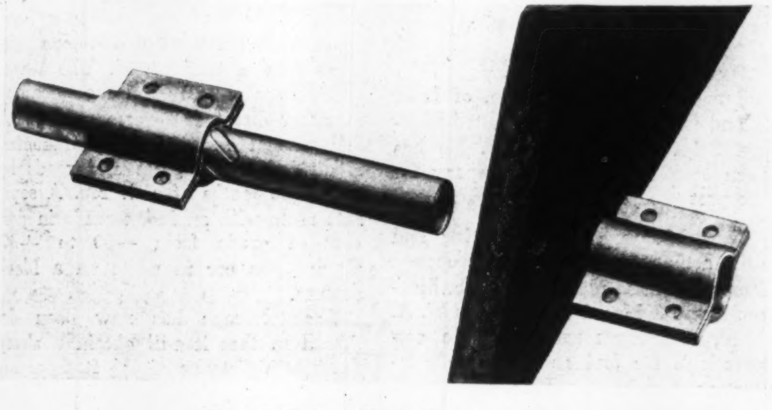
A new crawler shovel designed and built by Link-Belt Co. of Chicago for an Ohio coal mining company has an all-welded boom and dipper stick. In spite of a 36 ft. boom and 28 ft. stick as compared with 35 and 21 ft. for the previous design and a bottom end flared to eliminate hog roads, the new design weighs 10 per cent less than the old one. Said to be twice as strong, the new design costs 20 per cent less.

EQUIPMENT IN BRIEF

A Sketch Sheet, providing a 7x7½-in. drawing area, laid out in ⅛-in. squares, with the inch lines heavy and numbered, on an 8½ x 11-in. sheet is offered by Wade Instrument Co. in Cleveland. An identifying heading form is provided on each sheet. The paper is also available with a 7 x 10-in. sketching area without other printing. The new paper is durable and can be used for permanent records.

A Method for the transfer of blueprints to tracing cloth, thus providing a new tracing from which an unlimited number of blueprints can be made, has been developed by the Lake Photoprint Co. of Chicago. The company's facilities enable them to handle any size blueprint and prepare a tracing from it. Tracings can be prepared in all widths up to cloth limit of 54 in. and in any length.

An Electric Integrator now used on mechanical and electrical flowmeters of the Bristol Co. of Waterbury, Conn., totalizes flow once every 15 seconds. A flat disk cam mechanically computes the square root of the differential pressure across an orifice plate or venturi tube constriction in a pipeline at 15-sec. intervals. The values obtained are totalized by means of a counter and are indicated on a 6-figure integrator dial. The integrating mechanism consists of a continuously running telechron motor which operates the counter through a train of gears. These gears are engaged and disengaged through a mercury switch and magnet by a cam rider connected to the recorder pen arm, which operates the mercury switch in one direction while on the cam and allows it to return to its original position when off the cam.



Road Joint Reinforcement

A device designed to provide a dependable connecting support at the joint between concrete highway slabs, so as to eliminate vibration during load transfer, and at the same time permit free lateral slab movement during temperature changes, has been developed by the Five-Way Expansion Joint Co. of Chicago, in the T-G Bar. The T-G Bar consists of a pair of stress reducers, a metal sleeve, a dowel and two caps for closing the ends of the sleeves and seal in a lubricant. The stress reducers and sleeves are made of galvanized steel stampings. The affinity of the galvanized coating to concrete results in a permanent bond between the stress reducers and sleeves.

The dowel, a smooth, round, cold-rolled bar, fits tightly within the sleeve, and floats freely during expansion and contraction periods and in load transference, never coming in contact with the concrete.

Stress reducers, die formed from heavy gage steel, lie in the horizontal plane of the slab and provide an additional bearing surface in the concrete of about 11½ sq.in. The T-G Bar is completely assembled at the factory and comes ready for installation.

The manufacturers recommend that T-G Bars be set in joints at a distance of 20 in. center-to-center.

MANUFACTURERS' ACTIVITIES

The Uhl Construction Co. of Pittsburgh, has established a new department of standard steel buildings for industrial and commercial use. C. K Wehn, in charge of this department, has had 15 years experience in standard building construction, having formerly served in a similar capacity with the Truscon Steel Co. and as district manager for the H. K. Ferguson Co.

The Largest Number of employees in ten years are now on the payroll of the Worthington Pump & Machinery Corp. Increased activities at the corporation's plants at Harrison, Newark, Buffalo and Holyoke, Mass. have necessitated increasing the total number of employees 86 per cent since 1932 to a figure 6 per cent above 1929. It was recently announced by Worthington that unfilled orders were at the highest level in seventeen years.

Albert & Davidson Pipe Corp. of Brooklyn, and the L. B. Foster Co. of Carnegie, Pa. have recently purchased all of the wrought pipe, amounting to about 5,000 tons, located at the Eclipse works of the Atlantic Refining Co.'s plant at Franklin, Pa. Seventy-five per cent of the pipe is wrought iron and the balance steel.

More Than 400 Hercules diesel engines have been shipped against production orders of General Motors Corp. for use in commercial vehicles, it has been announced by the Hercules Motor Corp., Canton, Ohio. The units are standard Hercules DJXB 6-cylinder diesel engines, developing 77 hp. and will be used in Chevrolet truck chassis for foreign markets.

New distributors

B. & B. Wire Rope will be handled in St. Louis, Mo. for the Broderick & Bascom Rope Co. of St. Louis, by O. B. Avery Co.

In The Course of their expansion program, Ransome Concrete Machinery Co. of Dunellen, N. J., have appointed the following distributors to handle their line of truck mixers and agitators: Edelen & Boyer Co., Philadelphia; Wm. T. Johnston Co., Cincinnati, Ohio; and W. T. Walsh Equipment Co., Cleveland, Ohio.

Chicago Pneumatic Tool Co. has opened a direct factory sales and service branch in Salt Lake City. Mr. Otto A. Ray is manager.

A New Sales Office in Oakland, Calif. has been opened by The Linde Air Products Co., a unit of Union Carbide & Carbon Corp., New York City. This brings the number of Linde offices throughout the country to a total of 33.

Steel and Tubes, Inc., a subsidiary of the Republic Steel Corp. of Cleveland, has opened a branch office in Baltimore. The new office with Mr. H. H. Smith in charge, will handle the entire line of products including stainless steel and structural carbon steel tubing and conduit.

Uhrich Supply Co. will distribute B & W seamless boiler tubes in Western Missouri and Kansas City for the Babcock & Wilcox Tube Co. of Beaver Falls, Pa.

Plant expansion

Enlargement of the plant, offices and engineering department of the Ideal Commutator Dresser Co., Sycamore, Ill., nearly doubles the company's available floor space. Addition of a new wing to the company's main building has increased office space by 3,000 sq. ft. and the engineering department space by 1,000 sq.ft.

Personnel changes

The Laminated Shim Co. of Long Island City, N. Y. has appointed Richard Seipt as sales manager. He has been connected with the company for the past two years.

New Manager of engineering and sales activities at the recently reopened Holyoke, Mass., plant of the Worthington Pump & Machinery Corp., is W. A. Neill, formerly manager of the corporation's air tool and portable compressor division at Harrison, N. J. Manufacture of portable automotive and vertical compressors and of rock drills is carried on at Holyoke.

Expansion of the technical staff is marked by the International Nickel Co.'s appointment of Wayne Z. Friend to the development and research staff. Mr. Friend will devote most of his time to technical service on corrosion resisting materials, particularly Monel metal and Inconel.

O. E. Thaleg has been appointed manager of the Chicago district office of the Traylor Engineering & Mfg. Co. of Allentown, Pa.

New Assistant Sales Manager of the Winton Engine Corp., subsidiary of General Motors, is Max H. Schachner. His principal responsibility will be direction of the sale of the new Winton two-cycle diesel engine.

Harnischfeger Corp. of Milwaukee has appointed C. H. Boeing as P & H sales engineer to handle the entire line of Harnischfeger products in western New York State.

Howard V. Harding has been appointed district sales manager in the New York territory for Lukenweld, Inc., a division of the Lukens Steel Co. of Coatesville, Pa.

New Officers of the Chapman Valve Mfg. Co. of Indian Orchard, Mass. are; president, John J. Duggan, and Treasurer, Frederic C. Low. Mr. Duggan has been treasurer of the company for the past 20 years and both men have been associated with the organization for more than 30 years.

George H. Reiter, A. C. Cronkrite, O. H. D. Rohwer, and A. O. Stark have been elected vice-presidents of Universal Atlas Cement Co., with headquarters in Chicago.

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Light Transit-Level

The Gurley tilting level which was introduced by W. & L. E. Gurley of Troy, N. Y. in 1928 for the use of contractors and builders, has now been given a full swinging telescope and made into a transit-level. The reversion level vial will level the telescope in either direct or reverse position. A full vertical circle, 4 in. in diameter, is divided into degrees and reads by vernier to tenths of a degree. A separate scale with an index reads in per cent of grade from —30 to +30. Graduations are in white on a black surface.

The telescope has now been designed so that it will obtain a sharp focus at a distance of 4½ ft. from the center of the instrument. The design of the telescope standard has been improved in the direction of greater rigidity and strength.

The new instrument sells for $150.

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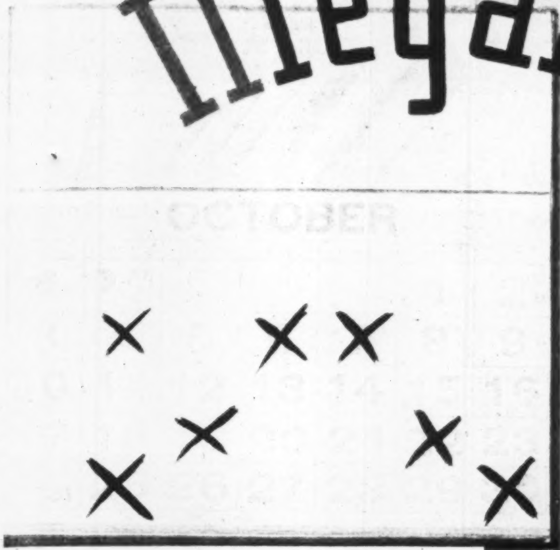
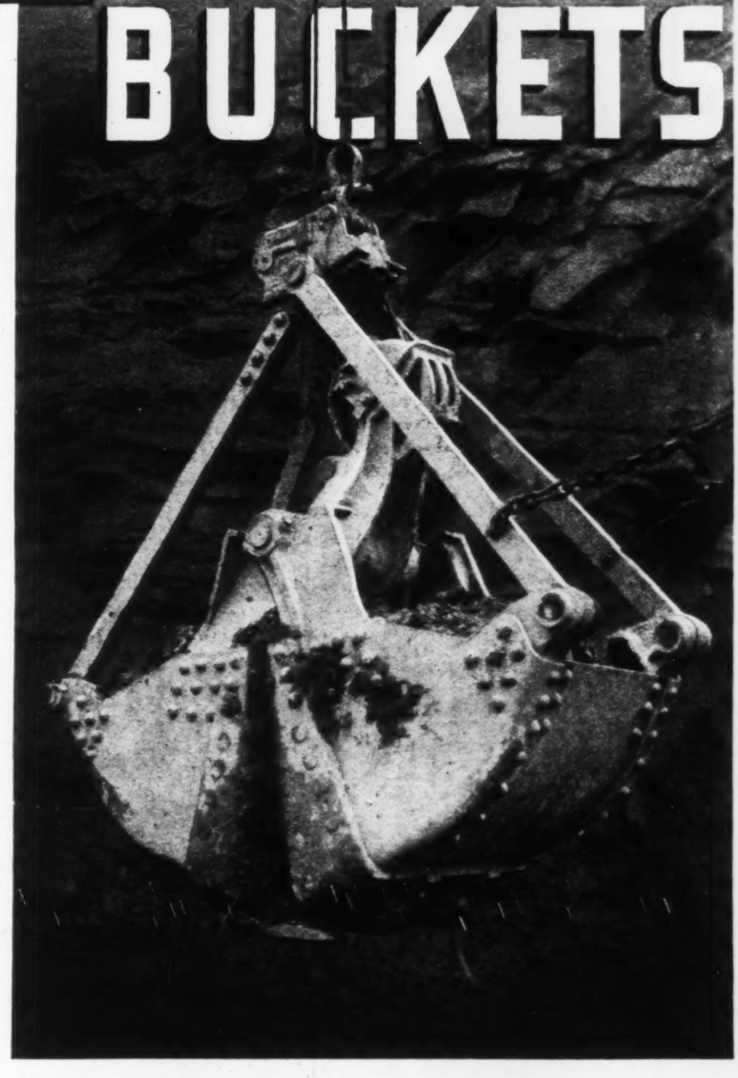
Talking Picture on Heat

A sound motion picture on "Heat and Its Control" has been produced by Johns-Manville, New York City, visualizing the story of heat from early sun worship through present manufacture of insulation materials. Laboratory demonstrations, animated drawings and shadowgraphs are used in the picture to illustrate various types of heat transfer and to show the nature of insulating action.

Illegal Holidays -Unknown to Blaw-Knox BUCKETS





The proper use of modern steels and alloys at critical points is your assurance of long uninterrupted service with a Blaw-Knox DREADNAUGHT Bucket.

There are no "weak links" in Blaw-Knox construction. Outstanding features which prove vital to long life and successful bucket performance, are—

- ★ the One Piece Cast Head
- ★ Heavy, Forged, One Piece Corner Bars
- ★ Hardened Alloy Steel Cutting Lips
- ★ Hardened Steel Pins and Guide Rollers
- ★ Ball Bearing Equipped Lever Arm Sheaves
- ★ Reeving Without S-Bends Eases the Wear on Wire Rope

If you aim to reduce maintenance costs and prolong the useful life of your buckets—investigate the Blaw-Knox DREADNAUGHT for all types of digging and rehandling.

Send for Bulletin No. 1561—"Blaw-Knox Buckets for Contractors".

BLAW-KNOX COMPANY

2001 Farmer's Bank Building · Pittsburgh, Pa.
Offices and Representatives in Principal Cities

(Contract Unit Prices continued from page 576)

18. Concrete, cl. B	320 c. y.	12.00	13.00	12.00
19. Masonry, stone, prpts	9 c. y.	20.00	35.00	38.00
20. Masonry, stone, laid dry	135 c. y.	9.00	10.00	9.00
21. Backing, loose stone	135 c. y.	2.00	2.00	1.50
22. Met. reinf	95,150 s. y.	.23	.23	.25
23. Steel fabric reinf	45 s. y.	.25	.25	.25
24. Joint supports	9,700 ea.	.45	.45	.49
25. Bar reinf	13,100 lb.	.05	.06	.05
26. Struct. steel	30,000 lb.	.05	.06	.05
27. Misc. iron	4,600 lb.	.10	.10	.06
28. Cable guard railing	22,500 l. f.	1.00	.90	1.00
29. Guide posts	110 ea.	2.50	2.50	2.50
30. Fdn., bank gravel	8,000 c. y.	.85	1.50	.01
31. Cem. conc. pavt	19,075 c. y.	5.00	5.00	6.40
32. Bit. mat. waterproofing	50 gal.	.50	.60	.60
33. Maint. traffic, culverts	L.S.	200.00	410.00	450.00
34. Maintain traffic	52,000 l. f.	.08	.06	.01
35. Protect traffic	l. s.	1,000.00	1,600.00	1,700.00
36. Dry rip rap	460 c. y.	2.00	3.00	3.00
37. Cofferdams	L.S.	100.00	100.00	100.00
38. Timber sheet piles	15.5 M.Cbm.	50.00	70.00	65.00
39. Timberpiles	2,000 l. f.	.60	.60	.80
40. Pile driving equip't	L.S.	250.00	250.00	275.00
41. Broken stone	255 c. y.	3.50	3.00	3.20
42. Conc. R/W markers	375 ea.	2.50	2.50	2.50
43. Timber, lumber	1 M.fbm.	60.00	60.00	50.00
44. Top soil	10,700 c. y.	.80	1.00	.75
45. Explosives	2,000 lb.	.30	.30	.30
46. Finish grade, fert., seed	10.8 acre.	200.00	200.00	180.00

V—ST. LAWRENCE COUNTY

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clear, grub	l. s.	$550.00	$550.00	$600.00
2. Excav. unclass.	59,600 c. y.	.40	.25	.30
3. Excav., structures	1,960 c. y.	1.00	1.10	1.00
4. Overhaul	20,000 s. y.	.005	.005	.005
5. Trim shoulders	92,785 l. f. rd.	.20	.10	.22
6. Prepare fine grade	17,550 s. y.	.10	.05	.11
7. Sewer pipe, opt., 6 in	50 l. f.	.40	.20	.40
8. Sewer pipe, opt., 8 in	50 l. f.	.55	.55	.40
9. Sewer pipe, opt., 12 in	50 l. f.	1.00	1.00	1.00
10. Sewer pipe, opt., 18 in	50 l. f.	2.00	2.00	2.00
11. Sewer pipe, opt., 24 in	50 l. f.	3.00	3.00	3.00
12. Pipe undrdr., opt., 6 in	1,500 l. f.	.35	.35	.35
13. C. m. p., 18 in	120 l. f.	4.30	4.30	3.00
14. C. I. or R. C. pipe, 18 in	100 l. f.	3.00	3.00	2.85
15. C. I. or R. C. pipe, 24 in	322 l. f.	5.00	5.00	4.00
16. C. or R. C. pipe, 36 in	50 l. f.	11.00	11.00	9.00
17. Portland cement	2,687 bbl.	3.20	2.85	2.75
18. Natural cement	765 bbl.	2.25	2.25	2.20
19. Concrete, structures	110 c. y.	19.00	17.00	15.00
20. Concrete, cl. A	674 c. y.	19.00	17.00	15.00
21. Concrete, cl. B	43 c. y.	15.00	15.00	14.00
22. Bar reinf	11,175 lb.	.06	.05	.05
23. Misc. iron, steel	2,400 lb.	.10	.10	.08
24. Reset cable guide rail	1,030 l. f.	.25	.26	.25
25. Cable guard railing	1,650 l. f.	1.25	1.15	1.10
26. Reset guide posts	308 ea.	1.00	1.00	.75
27. Guide posts	56 ea.	2.50	2.50	2.50
28. Fdn., bank gravel	4,750 c. y.	1.00	1.25	1.10
29. Fdn., bank gravel, L. M	5,000 c. y.	.90	1.05	1.10
30. Bot. c'se, bit. mac. P. M.	1,575 c. y.	4.50	4.25	3.50
31. Bot. c'se bit. mac. M. M.	25,000 ton	1.90	2.45	2.30
32. Top course, bit. mac. M. M.	30,100 tons	4.40	5.20	5.20
33. Bit. mat. A, pen. meth	203,600 gal.	.11	.11	.09
34. Maint. traffic, culverts	l. s.	370.00	370.00	400.00
35. Mt. traffic, bit, mac	26,805 l. f. rd.	.20	.10	.20
36. Protect traffic	L. S.	2,750.00	2,500.00	2,750.00
37. Dry rip rap	100 c. y.	2.00	2.00	2.20
38. Clean ex. pavt	18 mile	100.00	100.00	70.00
39. Broken stone, l. m.	750 ton	3.20	2.50	2.10
40. Curbing, conc., type	11,350 l. f.	1.00	.95	.75
41. Gutters, conc	2,850 s. y.	2.50	1.50	1.70
42. Catch basins, manholes	10 ea.	45.00	45.00	40.00
43. Ch. elev., manh., ctb	61 ea.	15.00	10.00	10.00
44. Timber	1 M.fbm.	60.00	1.00	50.00
45. Met. reinf., culverts	3,800 s. f.	.20	.15	.15

STEEL FOOT BRIDGE, CALIF.

OWNER: Public Utilities Commission; N. A. Eckart, Chief Engineer, San Francisco, Cal.

PROJECT: Construction of 100-ft. steel footbridge spanning portion of Moccasin Reservoir in Tuolumne County, for City and County of San Francisco, Calif.

BIDS: Three bids were opened in August, 1937, ranging from the low of $2,424 to a high of $3,355, with contractor furnishing all materials and minimum hourly wages stipulated at $1.66 for skilled and 75c. for common labor.

LOW BIDDERS:

1. L. Ubels, Ripon, Calif.	$2,424
2. J. C. O'Leary, San Francisco	2,964
3. D. W. Nicholson, Oakland, Calif.	3,355

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excavation	15 c. y.	$5.25	$7.00	$6.00
2. Reinforced conc. bent	l. s.	255.00	297.00	524.00
3. Concrete footings	7 c. y.	24.25	40.00	31.00
4. Reinforcing steel	200 lb.	.15	.07	.06
5. Steel bridge	l. s.	1,890.00	2,268.00	2,512.00

SUNSET RESERVOIR, SAN FRANCISCO

OWNER: Public Utilities Commission, San Francisco.

PROJECT: Concrete lining, roof and control works for Sunset Reservoir, Ortega, Pacheco, 24th and 28th Aves., San Francisco. Excavation of basin and construction of embankment completed under another contract. Work includes refilling of erosion channels in existing inner slopes and reservoir crest, preparation of bottom surface of basin, excavating for column footings, struts and sills, concrete lining and roof slab, installation of gates, controls, etc.

CONDITIONS: Wage rates as stipulated for all city public works: 75c. to $1.67. Contract time, 320 days. Owner furnishes gate valves, misc. metal work and cast-iron bell-and-spigot pipe.

BIDS: Eight proposals received in July, 1937, ranging from $793,397 to $960,604. Contract awarded to low bidder.

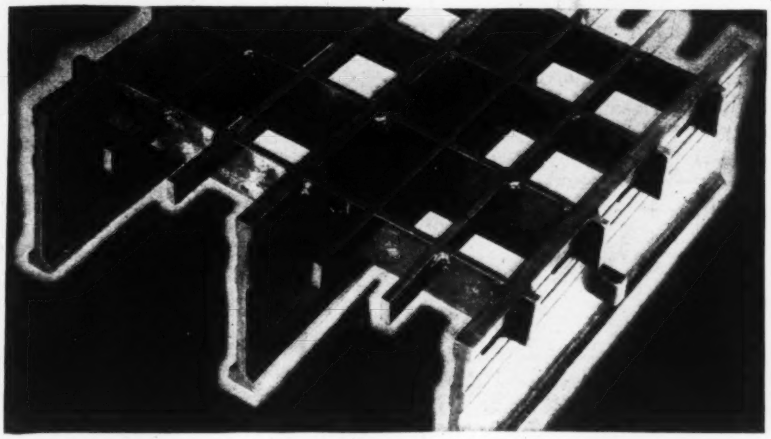
LOW BIDDERS:

1. MacDonald & Kahn, San Francisco (contract)	$793,397
2. C. L. Harney, San Francisco	798,221
3. R. G. Clifford, San Francisco	801,569

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Tamp erosion refill	300 hr	$3.50	$6.75	$3.19
2. Trim inner slopes, crest	29,000 s. y.	.50	.42	.48
3. Prepare reservoir bottom	L. S.	11,502.00	7,700.00	8,520.00
4. Struct. excav., earth	3,200 c. y.	3.00	2.00	2.30
5. Struct. excav., rock	500 c. y.	5.00	3.00	4.80
6. Concrete, reservoir	12,870 c. y.	9.70	12.40	10.50
7. Concrete, conduit, spillway	3,200 c. y.	17.50	18.75	20.25
8. Concrete, roof slab	10,200 c. y.	23.80	20.25	22.00
9. Extra cement	400 bbl.	2.00	2.02	2.20
10. Reinf. steel	3,600,000 lb.	.05	.04605	.0493
11. Welded wire mesh, 4 x 4, No. 6	58,000 s. y.	.60	.52	.572
12. Welded wire mesh, 4 x 16, No. 6	600 s. y.	.30	.24	.26
13. Copper water stops	5,000 lb.	.70	.73	.53
14. Asbestos sheet pack'g	320 s. f.	1.25	.50	.50
15. Slide gates	L. S.	7,000.00	10,000.00	8,200.00
16. Water screen, elec. equip	L. S.	7,600.00	9,000.00	8,740.00
17. Cast steel fittings	25,000 lb.	.24	.25	.33
18. C. I. fittings, flanged	7,500 lb.	.10	.15	.15
19. Handrails, wrought steel p	13,500 lb.	.10	.23	.24
20. Struct. steel	74,000 lb.	.145	.14	.15
21. Misc. metal work	2,000 lb.	.57	.35	.22
22. Gate valves, install.	39,000 lb.	.03	.03	.04
23. Install C. I. bell, misc. met	97,000 lb.	.02	.03	.04
24. Welded steel pipe 54 in.	1,050 in.	13.00	17.00	17.48
25. Welded steel pipe, 60 in.	900 l. f.	14.00	18.25	20.35
26. Bev. courses, curv. secs., 54 in	10 ea.	30.00	100.00	75.22
27. Bev. courses, curv. secs., 60 in	15 ea.	35.00	100.00	91.50
28. Steel pipe specials	17,700 lb.	.10	.20	.16
29. Flex. couplings, 54 in., 3/8 in	1 ea.	90.00	100.00	110.00
30. Flex. couplings, 50 in., 3/8 in	1 ea.	100.00	100.00	119.00
31. Bit. enam. coating, steel pipe	60,000 s. f.	.08	.10	.10
32. Felt wrap, steel pipe	24,000 s. f.	.05	.06	.06
33. Excav., backfill trenches, earth	7,700 c. y.	1.60	2.30	1.27
34. Excav. backfill trenches, rock	500 c. y.	6.00	5.50	1.92
35. Repavement	12,000 s. f.	.35	.26	.48
36. Reinf. conc. pipe, 24 in.	890 l. f.	5.40	5.40	4.74
37. Roof screens	L. S.	3,000.00	2,000.00	3,433.00
38. Conc. sidewalks	10,000 s. f.	.25	.15	.16
39. Armored conc. curbs	210 l. f.	1.50	1.00	.70
40. Chain-link fence	L. S.	2,800.00	3,000.00	2,700.00
41. Tri. mesh fence, redwood posts	L. S.	300.00	400.00	18.00
42. Road grading	800 c. y.	1.75	.50	.60
43. Repair outer embankment slopes	200 c. y.	5.00	2.75	.70
44. Seal construct. joints.	43,500 l. f.	.06	.23	.10

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



New Open Floor

A new open floor, U.S.S. I-Beam Lok Open Floor, has been developed by the Carnegie-Illinois Steel Corp., Pittsburgh and Chicago. The floor is very similar to the U.S.S. I-Beam-Lok Floor. It consists of special, extra-depth 5-in. beams, which form the load-carrying members, spaced 6 in. on centers. Crossing the beams at 3 in. intervals are 1¼x¼ in. bars notched at the top to receive two additional supplementary ¾x¼ in. cross bars spaced equally between the main carrying beams. The assembly produces a steel surface with rectangular openings about 1⅝x2¾ in.

For an H-20 loading the new open floor can be applied directly to stringers without supplementary supporting steel if the stringer spacing is not greater than 4 ft. 6 in. The floor has a total weight of 18.3 lb. per sq. ft.

The floor is fabricated in standard widths up to 6 ft. 1½ in. and in lengths up to 49 ft. The units may be placed with the main carrying beams parallel or at right angles to traffic.

• • •

Seven New Members In Producers Council

Seven large companies have been admitted to membership in the Producers Council, organization of building-products manufacturers affiliated with the American Institute of Architects, since its June meeting. These companies include the International Nickel Co., National Radiator Co. of Johnstown, Pa., The Flintkote Co. of New York, Detroit Steel Co., Curtis Co. of Clinton, Iowa, Gladding McBean Co. of San Francisco, and the Richmond Screw Anchor Co. of Brooklyn. These companies bring the total membership of the Producers Council to 51.

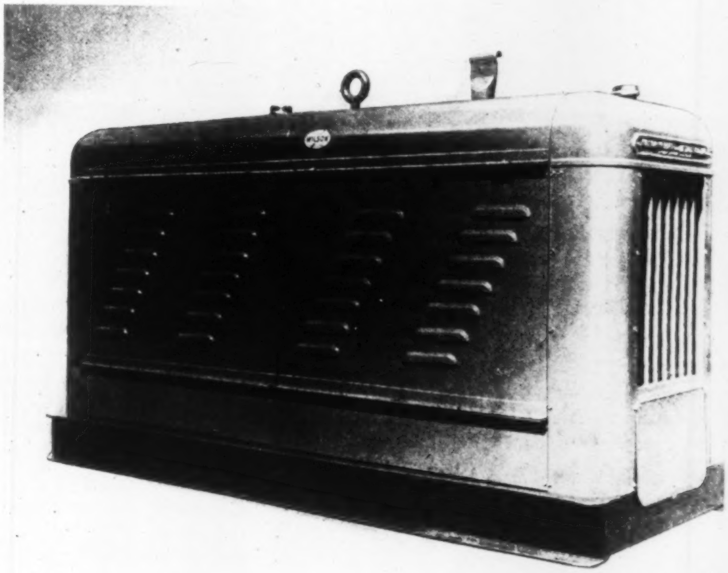
The Producers Council was formed in 1921 at suggestion of the A.I.A.

New High Tensile Steel

A new type of low-alloy high tensile steel, Mayari R, has been developed by the development and research department of the Bethlehem Steel Co. The new alloy, particularly intended for use in the fabrication of sheets to be welded, has a strength appreciably in excess of ordinary structural steel, with a minimum strength of 65,000 lb. per sq. in. and minimum yield point of 50,000 lb. per sq. in. It is said to possess good hot and cold working properties, and the welding characteristics are such that annealing is not necessary. It has been designed to show little tendency to harden on rapid cooling in order to meet conditions of welding work.

Great resistance to atmospheric corrosion is provided; it is estimated on the basis of tests made by the company over a period of years that the corrosion resistance of Mayari R is two or three times that of copper steel and that is thus about six times that of ordinary steel.

The carbon content of Mayari R is quite low, about 0.10 per cent, the strength and corrosion resistance are obtained by addition of nickel, chromium, manganese, silicon, copper and phosphorus.



Pipe Line Welder

A new electric welding machine designed especially for pipe line work has been developed by the Wilson Welder & Metals Co., Inc., of New York City. The machine, furnished in 300 and 400 ampere capacity, is named the Yellow Jacket.

Features incorporated to meet the unusually rigorous conditions of pipe line work include double sediment collectors for carburetor supply, improved idling device, 36 gal. gasoline tank, and an improved current switch. Other features are a center of gravity only one foot above the base, lightweight reinforced base and framework, center lifting bail, and a protective radiator grill.

NEW PUBLICATIONS

A GREAT VARIETY of accessory equipment for laying pipe, ranging from heaters for calking compounds to pipe cleaning brushes, is described in Catalog No. 20, "American Pipe Line Equipment."—American Steel Works, Kansas City, Mo.

THE LATEST of the DuPont service bulletins tabulates the brands of Du Pont explosives and the uses to which they are adapted.—E. I. Du Pont de Nemours & Co., Wilmington, Del.

"UNION CONSTRUCTION EQUIPMENT" is interesting for the great variety of contractors' equipment described: pile drivers, tunnel shields, air locks, contractors' tubs, buckets, and sheaves, pumps and pneumatic concrete placers are some of the items listed.—Union Iron Works, Elizabeth, N. J.

"HAYNES STELLITE Products in the Oil Field" describes in an interesting way the applications of hard facing to oil field work.—Haynes Stellite Co., New York City.

THE 1937 EDITION of the Portland Cement Association's "Cement and Concrete Reference Book" has just been issued. It contains current statistics and general data about the portland cement industry.—Portland Cement Association, Chicago.

MORE SNOW REMOVAL equipment is described in a folder on Adams snow plows and snow wings for use with Adams motor graders.—J. D. Adams Co., Indianapolis, Ind.

A MULTITUDE of useful gadgets of an electrical nature are described in a catalog "New Products."—Ideal Commutator Dresser Co., Sycamore, Ill.

"PROTECTION" is the title of a new catalog of Gamewell industrial fire alarm systems.—The Gamewell Co., Newton, Mass.

"GETTING DOWN to Pay Dirt" describes, mostly in pictures, a lot of uses for LeTourneau equipment in mines, pits and quarries.—R. G. Le Tourneau, Inc., Peoria, Ill.

JUST OFF the presses is a brochure entitled "Lux Makes the Difference" showing the features of built-in carbon dioxide fire protection systems for industrial plants and electrical properties.—Walter Kidde & Co., New York City.

"FIVE WAYS to Buy Equipment" is a discussion of means of financing plant modernization, and particularly of the CIT equipment funding plan.—Commercial Investment Trust, Inc., New York City.

A BIG 60-page catalog of Thor rock drills, paving breakers, clay diggers, sump pumps, and accessories is entitled Catalog No. 41.—Independent Pneumatic Tool Co., Chicago.

A HANDSOMELY printed and illustrated Westinghouse pamphlet describes that company's diesel electric drives.—Westinghouse Technical Press Service, East Pittsburgh, Pa.

DURING the filming of its motion picture, "Heat and Its Control," Johns-Manville gathered together a lot of information that couldn't be compressed into a movie. Consequently they have printed a brief book, "Heat," which constitutes a popularized textbook on the theory of heat and insulation.—Johns-Manville Corp., New York City.

TWO PAPERS have been published dealing with Franklin floor maintenance materials. "Water Emulsion Waxes," available to any commercial consumer, points out ways by which the layman may judge the respective values of different brands of waxes. Available to architects and contractors is a set of architectural specifications covering modern methods of finishing all types of floor surfaces.—Franklin Research Co., Philadelphia, Pa.

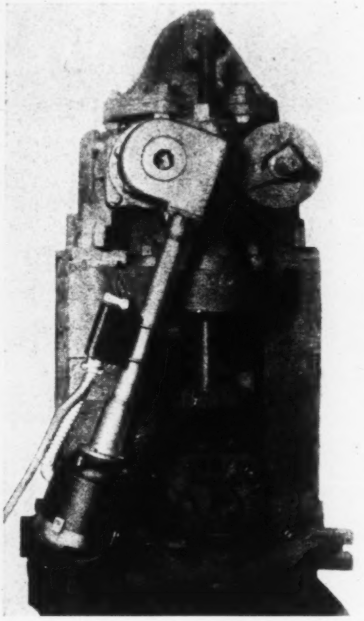
FEATURES of the Lee direct-fired unit heater are described in a 20-page booklet.—Dravo Corp., Machinery Div., Dept. AA, Pittsburgh, Pa.

THE VALUE of using wrought iron in tank construction is pointed out in a new technical bulletin prepared by Byers' engineering service dept. Service histories of a number of older wrought iron tanks are given, as well as a selection of the more interesting newer applications.—A. M. Byers Co., Pittsburgh, Pa.

UNUSUAL TRICKS of format, involving skeleton views and folding inserts, enliven an attractive catalog of Peerless deep well turbine pumps. Attractively printed in color and spring bound to lie flat, the booklet discusses at length the features and characteristics of Peerless pumps and also gives a dozen pages of engineering data including useful hydraulic tables and charts.—Peerless Pump Division, Food Machinery Co., Los Angeles.

A PICTURE PORTFOLIO of rubber flooring installations, wire bound in stiff stock covers, contains 95 handsome pictures covering nearly every type of the more common applications of rubber flooring. Only one page of text appears in the entire book.—Goodyear Tire & Rubber Co., Akron, Ohio.

THREE PUBLICATIONS discuss the application of Cletrac equipment in snow removal work. "Putting Stretch Into Tax Dollars" and "What a Headache" are folders, and "Cletracs for Snow Removal" is a small pamphlet.—The Cleveland Tractor Co., Cleveland, Ohio.

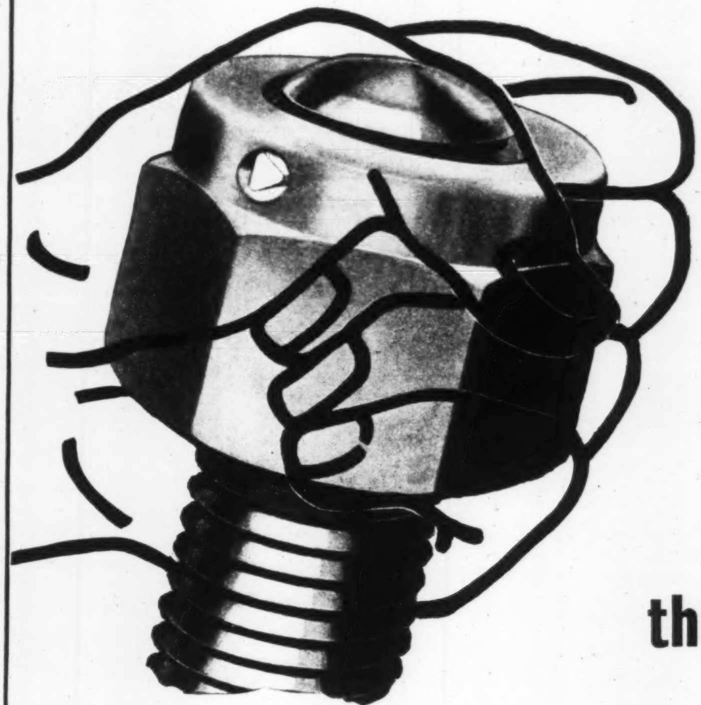


Motor-Driven Wrench

An unusual application for the torque motor manufactured by the Ohio Electric & Mfg. Co., Cleveland, is a motor-driven wrench which is being used in a leading rolling mill for applications in which nuts and screws of large size must be adjusted frequently or where lack of room renders the ordinary hand wrench difficult to manipulate. The wrench, which was designed in the mill engineering department, consists of an aluminum torque-tube containing a shaft which is direct-connected to the motor at one end and to a worm-gear speed reducer at the other. The center of the worm-wheel carries the socket wrench.

The special torque motor is used in the wrench to avoid burning out when the motor is stalled by the final tightening down of the screw. The Ohio Electric & Mfg. Co.'s torque motors are so built that they can be stalled across the line without injury and under these conditions will exert full torque for periods from ten minutes at a time during each hour up to an indefinite period, depending on their particular ratings.

They take hold



-and won't let go-

'til you "tell" them with a wrench

Once the "Unshako" has been fully tightened, the locking ring positively prevents its backing off. It supplies a live, counteracting force within the nut that defeats vibration's efforts to shake it loose as effectively as could a giant hand's constant grip.

Yet . . . an ordinary wrench, applied without undue effort, will back-off the "Unshako" as smoothly as you please.

Every "Unshako" Self-Locking Nut is a self-contained unit . . . no extra washers, pins or other gadgets to bother with.

"Unshako" is the surest safeguard against accidents or operating loss due to nuts working loose.

Fill in and mail the coupon . . . get all the facts.

UNSHAKO

The Nut That Can't Shake Loose

STANDARD PRESSED STEEL CO.

JENKINTOWN, PENNA.

BRANCHES
BOSTON
DETROIT
INDIANAPOLIS

Box 562

BRANCHES
CHICAGO
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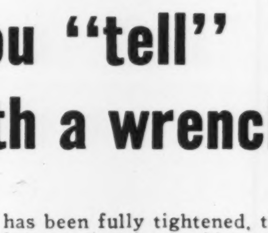


Pat'd. and Pat's. Pending
Fig. 1510

Cutout section showing Locking Ring in place.

Gentlemen:

Send us more information about "Unshako"—

Mr. .... Title ....

Firm .... Address ....

(Continued from page 614)

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-. PLATE	REINF. BARS ¾-in. billet *b*	RIVETS ¾-in. structural	WIRE NAILS Base	SHEET PILING Base	STEEL RAILS Per Gross Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle bars	Std. spikes *c*	Tie plates *c*	Track Bolts
Birmingham	$2.40	$2.60	$3.70	$2.55	....	$42.50	$43.00	$42.00	$2.80	$3.15	$2.30	$4.35
Chicago	2.30	2.60	3.70	2.80	$2.70	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Pittsburgh	2.25	2.55	3.60	2.75*d*	2.60	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Buffalo	2.35	2.60	....	....	....	....	....	....	....	....	2.30	....
Cleveland	2.435‡	2.60	....	....	....	....	....	....	....	....	....	....
Youngstown	....	2.60	....	....	....	....	....	....	....	3.15	....	....
Gulf ports	2.65a	2.95a	....	....	3.05a	....	....	....	....	....	....	....
Pacific ports	2.80a	2.95a	....	....	3.05a	....	....	....	....	3.15	2.40	....

‡ Delivered. *a* F.o.b. cars dock. *b* For rail steel deduct 15c. from billet prices. *c* Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., on spikes alone, Lebanon, Pa., Richmond, Va. *d* Add switching charge $18 per c.l.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb., base price	REINFORCING BARS Per 100 lb., ¾ in., base price 15 tons or over *b* New billet	Rail steel	Add $/cwt. for Switch	Del.	EXPANDED METAL LATH Per 100 sq.yd., carload lots Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING Per 100 s.f., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires Per sq. yd.	SHEET PILING Per 100 lb base price
Atlanta	$3.65	$2.82	$2.67	.02½	.10	$21.00	$23.00	$1.75	$1.31	$0.1692	$2.60
Baltimore	3.70	2.92	2.77	....	.10	23.00	25.00	1.62	1.22	.1566	3.00
Birmingham	2.40*a*	2.60	2.45	.02½	.10	22.50	24.50	....	....	.....	....
Boston	4.07	3.03	2.88	$20 C.L.	.10	21.60‡	23.60‡	1.68	1.26	.1620	3.02
Chicago	2.30*a*	2.60	2.45	.03	.05	23.00	25.00	1.61	1.22	.1557	2.70
Cincinnati	3.95	2.815*c*	2.665*c*	....	.05	25.01	29.50	1.60	1.21	.1548	....
Cleveland	3.86	2.60	2.45	.02½	.10	22.50	22.50	1.59	1.20	.153	....
Dallas	2.45	3.335	3.185	....	....	.....	.....	1.86	1.38	.1791	2.85
Denver	4.48	4.00	3.85	....	....	23.50	25.50	1.87	1.38	.1809	....
Detroit	3.95‡	2.70	2.55	....	.10	22.50	24.50	1.62	1.22	.1566	2.865
Kansas City	4.24	3.02*c*	2.87*c*	.0	.05	20.50	22.50	1.82	1.29	.1665	3.12
Los Angeles	3.825	2.90	2.75	.02½	.05	23.00	27.50	1.89	1.40	.1827	3.90
Minneapolis	4.00‡	2.90*c*	2.75*c*	.0	.10	26.00	30.00	1.71	1.28	.1656	3.00*d*
Montreal	2.90	2.40	2.40	....	....	32.50	32.50	2.46	1.82	.253	3.50
New Orleans	....	2.94	2.79	.05	.10	21.00	23.00	1.76	1.31	.1701	....
New York	3.97	2.88	2.73	....	.10	21.50	23.00	1.67	1.26	.1584	2.93
Philadelphia	3.90	2.84	2.69	....	....	22.50	24.50	1.63	1.23	.1575	2.89
Pittsburgh	2.25*a*	2.55	2.40	.02½	.10	20.00	22.00	1.55	1.18	.1494	2.60
St. Louis	3.99	2.87	2.72	.0	.05	22.00/23.00	24.00/25.00	1.62	1.21	.1566	2.70
San Francisco	3.95	2.95	2.80	.02½	.10	24.50	26.50	1.89	1.39	.1827	3.50
Seattle	3.10	2.95	....	....	....	25.50	27.50	1.89	1.39	.1827	3.05

‡ Delivered. *a* Mill prices. *b* 5-15 tons, add 15c. 1-5 tons, add 25c. Less than 1 ton, add 50c. *c* 20 tons or over Base. *d* Mill price plus freight.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in.*a*	VITRIFIED SEWER PIPE Per foot, 8 in., s.s.	delivered, 12 in., s.s.	ASTM 24 in., d.s.	C13–35 36 in., d.s.	CLAY DRAIN TILE Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTM C 14–35 12 in.	24 in.	WROUGHT STEEL PIPE Full standard weight. *h* 1 to 3 in., Butt Weld Black %	Galv. %	3½ to 6 in., Lap Weld Black %	Galv. %
Atlanta	$50.00	$0.26*bc*	$0.468*bc*	$1.69	$4.50*c*	$85.00	$128.00	$0.45	$1.625	44.5	35.5	42	32.0
Baltimore	53.50	.28	.54	2.38	6.75	110.00	170.00	.40	1.60	....	....	....	....
Birmingham	46.00	.25	.45	1.625	4.66	85.00	220.00	.40	1.60	64.5	55.5	62	52.5
Boston	53.50	.224	.432	1.98	5.8425	99.00	153.00	.45	2.50	....	....	....	....
Chicago	54.50	.28	.54	2.25	6.25	100.00‡	150.00‡	.38	1.48	52.5	41.25	50.625	37.5
Cincinnati	53.00	.203	.3915	1.665	5.0225	75.00	120.00	.60	1.90	52.6875	41.4375	49.5625	37.6875
Cleveland	54.50	.175	.3375	1.44	4.305	69.00	108.00	.35	1.75	56	44.5	51.5	40.5
Dallas	58.00	.40	....	....	....	160.00	260.00	.46	1.57	69.5	61.5	67	58.5
Denver	66.00	.29†	.50†	2.10†	....	130.00	220.00	....	....	44	33	41	29
Detroit	52.40	.203	.3915	1.71	5.2375	76.50	130.00	.33	1.50	53.2	41.9	50.1	37.8
Kansas City	56.00	.30	.54	2.16	5.00	120.00	240.00	.45	1.60	49	37.6	45.8	34.
Los Angeles	54.50	.282†	.508†	2.034†	5.085†	115.50	192.50	1.00	2.00	57.1	48.1	54.6	44.6
Minneapolis	57.00	.24†	.432†	1.728†	4.60†	......	......	.65	1.75	....	....	....	....
Montreal	55.00	.33†*e*	.59†*e*	2.04†*e*	....	82.00	134.00	.51	2.04	....	....	....	....
New Orleans	50.80	.26	.468	1.69	....	150.00	220.00	.45	1.65	....	....	....	....
New York	53.00	.28	.58	2.45	6.30	......	......	.50	1.50	52.49*i*	41.53*i*	48.20*i*	37.80*i*
Philadelphia	50.00	.224	.45	2.25	6.00	150.00	180.00	.54	1.80	64.5*i*	55.5*i*	62.*i*	52.5*i*
Pittsburgh	56.00	.182†	.351†	1.62†	4.92†	97.80	154.20	.85*g*	2.00*g*	64.5*j*	55.5*j*	62*j*	52.5*j*
St. Louis	53.00	.28	.504	2.016	3.96	85.00	170.00	.80	2.00	51.125	39.875	48	36.125
San Francisco	55.00	.315*d*	.567*d*	2.268	5.67	103.50	172.50	.45	2.50	53	44	42.75	33.33
Seattle	55.50	.294	.441	2.142	5.355	68.00	160.00*f*	.60*f*	1.60*f*	37	27	37	24

‡ Delivered. † F.o.b. *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $50.00. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. *b* Double strength. *c* List to dealer. *d* List. *e* Sales and municipal taxes extra. *f* Less 5% for cash. *g* Culvert pipe. *h* Discounts from standard list for delivery from warehouse, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ½ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92. *i* Resale price to consumer, car load lots shipped from mill. *j* Applies also at Lorain, Ohio, mills. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at destination. WROUGHT IRON PIPE: Base price and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base: Buttweld — 1 in. and 1¼ in. black 30, galv. 14; 1½ in. black 34, galv. 16½; 2 in. black 33½, galv. 16. Lapweld — 2½ in. to 3½ in. black 27½, galv. 12½; 4½ in. to 8 in. black, 28½ galv. 15.

LUMBER, TIMBER, PLYWOOD—PER M FT. B.M., CARLOAD LOTS F.O.B.

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR **All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)** *All Fir planks No. 2 common; Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)*									LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base price)	
	1x6, S4S	1x8, S4S	2x4, S4S	2x6, S4S	2x8, S4S	2x10, S4S	3x12, Rgh	6x12, Rgh	12x12, Rgh	2x12, Rgh	12x12, Rgh	5/8"	3/4"
Atlanta	**$16.50**	**$16.50**	**$16.00**	**$16.00**	**$16.50**	**$18.50**	**$23.00**	.....	.....	$42.00	$50.00	$16.80	$20.50
Baltimore	**30.00**	**30.00**	**33.00**	**33.00**	**33.00**	**35.00**	**45.00**	.....	.....	68.00	68.00	16.45*f*	20.05*f*
	36.00	*36.00*	*37.00*	*35.00*	*35.00*	*35.00*	*40.00*	*$40.00*	*$38.00*	.....	.....	.....	.....
Birmingham	**22.00**	**22.00**	**24.00**	**23.00**	**24.00**	**27.00**	**32.00**	**32.00**	**32.00**	.....	.....	15.55	18.95
[1]	26.00	26.00	30.00	29.00	30.00	35.00	54.00	.....	.....	48.00	53.00	.....	.....
Boston	32.00[2]	32.00[2]	35.00[3]	35.00[3]	52.00[1]	60.00[1]	70.00[1]	.....	.....	70.00	70.00	16.45*f*	20.05*f*
	32.00	*32.00*	*35.00*	*35.00*	*35.00*	*40.00*	*40.00*	*45.00*	*45.00*	.....	.....	.....	.....
Chicago	**28.00**	**28.50**	**31.00**	**30.00**	**31.00**	**40.00**	**40.00**	.....	.....	75.00	75.00	12.45	15.15
	35.00	*35.00*	*39.00*	*38.00*	*39.00*	*44.00*		*42.00*	*42.00*				
Cincinnati	**29.50**	**30.50**	**29.50**	**29.50**	**30.50**	**31.50**	**44.50**	.....	.....	52.50	38.50	15.55	18.95
	.....	.....	.....	.....	.....	.....	.....	*48.50*	*48.50*	.....	.....	.....	.....
Cleveland	**30.00**	**31.00**	**37.00**	**30.00**	**39.00**	**40.00**	**52.00**	*42.00*	*45.00*	52.00	65.00[9]	15.55	18.95
Dallas *e*	**30.00**	**31.00**	**33.50**	**29.50**	**32.00**	**33.50**	**52.50**	**51.00**	**69.50**	62.50	89.50	13.15	16.05
Denver ‡	**46.00**[4]	**46.00**[4]	50.00[4]	49.00[4]	49.00[4]	55.00[4]	54.00[4]	64.00[4]	67.50[4]	.....	.....	9.35	11.35
Detroit	**27.00**	**27.00**	**27.00**	**27.00**	**27.00**	**29.00**	**38.00**	.....	.....	32.00	44.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	*43.00*	*43.00*	*43.00*	.....	.....	.....	.....
Kansas City	**25.00**	**25.00**	**25.00**	**24.00**	**26.00**	**27.00**	**40.00**	.....	.....	55.00	60.00	11.45	13.95
	30.00	*30.00*	*31.00*	*30.00*	*30.00*	*31.00*	*35.00*	*38.00*	*38.00*	.....	.....	.....	.....
Los Angeles *a*	*36.00*	*35.00*	*36.00*	*35.00*	*37.00*	*37.00*	*41.00*	*48.00*	*43.00*	.....	.....	8.90*fg*	10.80*fg*
Minneapolis ‡*b*	54.00[6]	54.00[6]	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.45	13.95
‡	*45.00*	*45.00*	*48.00*	*46.00*	*46.00*	*47.00*	*65.00*	*67.00*	*67.00*	.....	.....	.....	.....
Montreal [7]	*46.00*	*48.00*	*52.00*	50.00	54.00	69.00	84.00	.....	.....	.....	.....	.....	.....
	54.75	*54.75*	*49.25*	*60.75*	*60.75*	*64.25*	*47.00*	.....	.....	.....	.....	.....	.....
New Orleans	**33.00**	**36.00**	**42.00**	**34.00**	**40.00**	**39.00**	**50.00**	.....	.....	54.00	59.00	13.15	16.05
	28.90	*31.50*	*35.90*	*29.50*	*33.00*	*34.00*	*38.00*	.....	.....	.....	.....	.....	.....
New York ‡	**36.00**	**37.00**	**36.00**	**37.50**	**37.50**	**39.00**	**44.00**	.....	.....	80.00	82.50	16.45*f*	20.05*f*
‡	.....	.....	*45.00*	*45.00*	*45.00*	*45.00*	*43.00*	*48.00*	*48.00*	.....	.....	.....	.....
Philadelphia	**25.50**	**27.00**	**26.50**	**27.00**	**28.00**	**29.00**	**31.50**	.....	.....	70.00	70.00	16.45*f*	20.05*f*
	40.00	*40.00*	38.25	*39.00*	*40.00*	*40.00*	*40.00*	*46.50*	*46.50*	.....	.....	.....	.....
Pittsburgh	**38.10**	**39.90**	**47.05**	**42.00**	**45.65**	**46.90**	**59.70**	.....	.....	.....	.....	16.20	19.70
	51.90	*49.60*	*49.60*	*49.00*	*48.90*	*49.25*	*66.55*	*66.55*	*66.55*	.....	.....	.....	.....
St. Louis ‡*c*	**30.00**	**31.00**	**29.00**	**28.00**	**29.00**	**31.00**	**48.00**	*55.00*	*55.00*	73.00	72.00	13.15	16.05
San Francisco *d*	*25.50*	*21.00*	*26.00*	*21.50*	*25.00*	*22.50*	*27.00*	*22.00*	*22.00*	.....	.....	6.95*f*	8.50*f*
Seattle	*22.50*	*23.50*	*23.50*	*22.50*	*22.50*	*22.50*	*26.00*	*26.00*	*26.00*	.....	.....	0.00	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers' N.C. Pine. [3] Spruce. [4] Native. [6] Western Pine, No. 3 Common. [7] Pine. Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors in Minneapolis and St. Paul get 10% discount from list. *c* 5M ft. or less. *d* At ship's tackle. *e* 10% discount taken off.

Note: Special concrete form grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, car load lots, delivered per 1000 sq. ft. surface. Base price — Seattle: 5/8", $63.75; 3/4", $72.75. For other centers add rail freight increment from table for proper size. Add: for form oil treatment, $2.50 per M. sq. ft.; for mineral paint sealed edges, $1.00 per M; for resin dipped treatment, $10.00 per M. *f* Lower rate by water shipment. *g* 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from latest jobbers list, Sept. 15, 1928 Single or Double Thickness		EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50-lb. cases delivered in 200 lb. lots*
	A quality	B quality	
Atlanta	85%	87%	$0.16
Baltimore	88%	87%	.16
Birmingham	87%	89%	.115
Boston	87%	89%	.16*d*
Chicago	86%	87%	.16
Cincinnati	89–10%	91–10%	.16
Cleveland	85–10%	85–10%	.20
Dallas	80%	80%	.175
Denver	85%	86%	.16*e*
Detroit	87–10%	89–10%	.16
Kansas City	86–10%	87–10%	.165
Los Angeles	90%*a*	90@40%	.1675
Minneapolis	84–10%	85–10%	.165
Montreal	60–30%	70–5%	.18†
New Orleans	88%*b* 85%*c*	86%*b* 80%*c*	.17
New York	89%	90%	.23*f*
Philadelphia	88%	89%	.16
Pittsburgh	86%	87%	.1525
St. Louis	88%	88%	.165
San Francisco	78%	83%	.165
Seattle	83%	86%	.1675

Price of 60% Ammonia Gelatin is $0.015 per lb. higher than 40%

a Disc. from list Aug. 1, 1929. *b* Single thickness. *c* Double.

*Urban prices influenced by service charges or local storage and delivery regulations, do not consistently reflect quantity prices in less congested areas. *d* Delivery charge of $4.00 for lots of 300 lb. or less. *e* F.o.b. Louviers, Colo. *f* In boroughs of Kings, Queens and Richmond, and in Manhattan south of Canal Street, add delivery charge of $6.00 per trip. †F.o.b.

40% Ammonia Gelatin price ranges in other than urban areas, per lb.

	C/L 20,000 lb. net	Tons	200 lb. lots
East of the Mississippi, except Florida	$0.115	$0.14	$0.16
West of the Mississippi, to Rocky Mountain States, and Florida	.12 –.13	.145 –.16	.165 –.18
Rocky Mountain States	.12 –.1425	.14 –.155**	.16 –.175**
Pacific Northwest States	.1175–.13	.1475–.155	.1675–.175
Pacific Southwest States	.1150–.1275	.145 –.1525	.165 –.1725

** F.o.b. Louviers, Colo., or Butte, Mont.

PILES, TIES—F.O.B.

PILES

Prices per linear foot, pine, with bark on, f.o.b. New York; delivered from barge 1½ to 2c. per ft. additional:

Dimensions	Points	Length	Short Leaf Barge	Short Leaf Rail
12 in. at butt	6 in.	30 to 50 ft.	$0.18	$0.195
12 in.—2 ft. from butt	6 in.	50 to 59 ft.	.225	.24
12 in.—2 ft. from butt	6 in.	60 to 69 ft.	.23	.255
14 in.—2 ft. from butt	6 in.	50 to 69 ft.	.24	.265
14 in.—2 ft. from butt	6 in.	70 to 79 ft.	.265	.275
14 in.—2 ft. from butt	5 in.	80 to 85 ft.	.38	.415
14 in.—2 ft. from butt	5 in.	85 to 89 ft.	.42	.482

RAILWAY TIES

Prices f.o.b., per tie, for carload lots:		6" x 8" x 8' Untr.	6" x 8" x 8' Tr.	7" x 9' x 8' 6" Untr.	7" x 9' x 8' 6" Tr.
Boston	Oak	$1.20	....	$1.75	....
	Pine	1.20	$1.70*a*	1.80	$2.60*a*
New York	S.L. Sap Pine	1.00/1.10	1.80*g*	1.25	2.25*g*
	Mixed Oak	1.45	....	1.75	....
Birmingham	White Oak	.85	1.50*a*	1.35	1.70*a*
	Southern Pine	.55*b*	1.10*ab*	.70	1.30*a*
Chicago	Oak	....	1.67*ac*	....	2.05*ac*
	Oak	....	1.55*d*	....	1.90*d*
	Southern Pine	....	1.50*a*	....	1.95*a*
Los Angeles	Douglas Fir	.64	1.38*a*	.90	1.80*a*
Philadelphia	Red Oak	1.25	....	....	2.60*a*
St. Louis	White Oak	1.25	....	1.60	....
	Red Oak	1.20	1.60*a*	1.50	2.00*a*
	Sap Pine or Cypress	1.05	....	1.35	....
San Francisco	Douglas Fir	1.15*bef*	....	....	2.45*caf*
Montreal	Birch or Maple	.65	1.05*a*	.75	1.35*a*

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 6" x 8" x 8' 6" *c* Empty cell. *d* Zinc. *e* Green. *f* At ships tackle. *g* Dense pine

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb.	$2.00–2.85
Chlorine cylinders, per lb. delivered	.055
Calcium chloride, 77–80%, flaked, in 400-lb. drums or 100-lb. moisture proof bags, f.o.b. works, freight equalized with points of competition, per ton	22.00–35.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	1.25
Soda ash, 58%, in paper bags, per 100 lb. dense	1.10
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	27.00–30.00
Sulphate of copper, in bbl., per 100-lb.	5.15–5.40

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M, lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M, lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M, in quantity, Common backing	Straight hard	LIME Per ton, Hydrated finishing	in paper, Common hydrated	carload lots, Pulverized or lump
Atlanta	$63.20	$67.40	$126.30	$126.30	$147.40	$168.40	$12.75	$15.15	$19.50	$14.00	$14.00
Baltimore	91.00	98.00	183.00	219.00	315.00	390.00	13.00	17.00	20.00	14.25	25.00
Birmingham	78.75	84.00	157.50	189.00	201.25	242.00	15.00	19.00	3.00o	1.75o	2.25
Boston	86.25ab	92.00ab	172.50ab	195.90ab	211.65ab	242.00a	16.00i	19.00i	19.00	15.00	3.50
Chicago	66.00	70.50	132.00	180.00	228.00	260.00	11.00	12.00	15.50	14.00	12.00
Cincinnati	56.45	60.40	115.25	138.70	166.50	206.40	17.50	17.50	15.80	12.70	....
Cleveland	49.00	52.00	97.50	117.00	149.00	185.00	16.50	16.50	16.80j	14.40j	2.65m
Dallas	59.00	62.00	125.00	149.00	155.00	177.00	9.50	24.00	19.00	16.00	.95
Denver	78.50	88.00	141.50	160.65	196.00	222.50	12.00	15.50	25.00j	17.00j	25.00
Detroit	71.85	76.65	143.70	230.00	280.00	325.00	15.00	16.00	19.00	16.00	16.00
Kansas City	64.50	66.50	81.00c	125.50	159.75	186.25	14.00	24.00	18.90	12.60	10.50
Los Angeles	73.50†r	89.50†r	128.00c†r	210.00†r	368.00†r	460.00†r	12.00	14.00	18.70	.....	19.70
Minneapolis	80.35	85.70	146.00	192.85	176.20d	245.20d	13.10	15.10g	21.00	16.00	19.00
Montreal	84.00a	96.00a	180.00a	......	273.00	......	15.50†	20.75†	23.50	17.00	11.00
New Orleans	72.00	72.00	135.00	162.00	180.00	220.00	14.00	.....	18.30	12.60	....
New York	87.00	93.00	128.00c	193.30h	238.80h	295.60h	12.50*	.....	20.00	15.50	20.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	.....	.....	16.10q	11.40q	10.90q
Pittsburgh	58.40	62.30	116.85	165.00	217.00	250.00	17.50	25.00	17.50	15.20	2.30m
St. Louis	62.00	65.00	120.00	180.00	234.00	280.00	16.00	17.00	.55k	.40k	2.25m
San Francisco	84.00	94.50	225.00	......	......	......	15.00	18.00	.55o	.40o	2.05m
Seattle	90.00	100.00	200.00	......	......	......	18.00f	18.00f	20.00s	20.00s	20.00s

a Smooth. *b* Carload lots delivered to job. *c* 6 x 12 x 12 in. *d* Not load bearing. *e* 8 x 8 x 8 in. only. *f* Less $1.00, ½ cash 15 days, balance 30 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* 50c per M off for cash. *j* LCL. *k* Per sack. *l* Lump. *m* Per bbl., 180 lb. *n* Per sack 100 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag. *q* 15-ton cars. *r* 5% discount 10 days. *s* 2% off cash. † F.o.b. * Subject to change because of strike.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

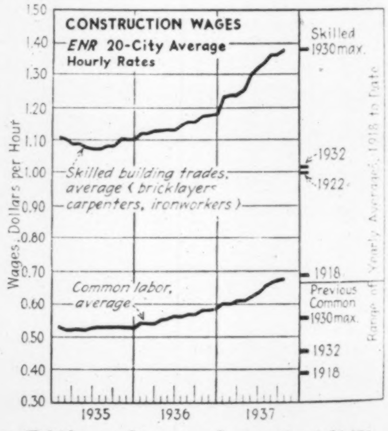
	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in oil	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *c*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f. o. b. factory Rolls, slate surfaced, 85-90 lb., per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 350 lb. bbl. per ton
Atlanta	$10.25	$12.375	$1.62	$3.17	$1.40	$2.68	$2.36	$2.36	$.36	$29.40
Baltimore	10.00	12.00	1.45	2.25	1.70	2.16	2.75	2.75	.40	27.50
Birmingham	10.25	12.375	2.35	2.35	1.85	2.16	2.14	2.14	.45	29.25
Boston	10.00	12.00	2.00‡	2.30‡	2.11‡	1.96‡	2.25h‡	2.14h‡	.45‡	20.00‡
Chicago	10.00	12.00	1.80	....	....	2.47	2.37	2.37	.43	33.00
Cincinnati	10.00	12.00	1.45	2.50	1.40	2.40	2.39h	2.39h	.36	21.00
Cleveland	10.00	12.00	1.90	2.60	1.40	2.10	2.14h	2.14h	.32	29.00
Dallas	10.25	12.75	1.80	2.10	....	2.75h	2.50h	2.50h	.60	60.00
Denver	10.50	12.50	....	....	....	2.45	4.00	3.00	.35	28.00
Detroit	10.00	12.00	1.80	2.50	1.50	2.30	3.00	2.75	.35	30.00
Kansas City	10.00	12.125	2.15g	2.40g	1.67g	1.93	3.15	3.15	.25	25.00
Los Angeles	10.25	12.25	1.60	2.25	2.30	2.10	1.50	.....	.45	.....
Minneapolis	10.00	12.125	....	....	....	1.85i	1.78hi	1.78hi	.29	23.80
Montreal	.....	8.20	2.00f	4.75f	2.40f	2.50	1.60	1.83	.50	1.52j
New York	10.00	12.00	1.90	2.60	1.65	1.85	1.87h	1.87h	.033e	26.00
Philadelphia	10.00	12.00	2.515	2.94	1.515	1.95	2.86h	2.86h	.29	26.00
Pittsburgh	10.00	12.00	1.05	1.95	.80	1.95	1.94h	1.94h	.34	26.00
St. Louis	10.00	12.00	1.70/1.90	2.50/2.75	1.50/1.90	1.90/2.00h	2.70/2.80	2.70/2.80	.25/.35	28.00/30.00
San Francisco	10.25	12.00	1.80	2.75	1.10–2.00	1.80	2.62	2.62	.36	18.00
Seattle	10.25	12.25	1.80	2.85	2.20	1.98	2.42	2.60	.73	28.00k

‡ Delivered. Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% maximum ferric oxide. *e* Per lb. *f* Sales tax extra. *g* 5 gal. cans. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Per 100 lb. *k* Asphalt pitch.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor Building	Heavy Const.
Atlanta	$1.25	$0.40/1.00	$1.00/1.25	$1.00/1.25	$1.25	$0.40/.50	$0.40/.50
Baltimore	1.25	1.25	1.50	1.50	1.25	.50	.50
Birmingham	1.50	1.125	1.25	1.125	1.00	.30/.40a	.30/.40a
Boston	1.50	.90/1.375	1.375	1.00/1.375	1.625	.60/.85	.60/.85
Chicago	1.70	1.625	1.625	1.625	1.70	1.025	1.025
Cincinnati	1.00/1.625	.70/1.35	1.40	1.00/1.40	1.00/1.625	.60/.75	.60/.75
Cleveland	1.625	1.375	1.50	1.50	1.50	.90	.90
Dallas	1.25	1.00	1.00	1.00	1.25	.40	.40
Denver	1.50b	1.50b	1.43b	....	1.43b	.714b	.714b
Detroit	1.50	1.25	1.50	1.50	1.55	.75/.80	.75/.80
Kansas City	1.50	1.375	1.50	1.50	1.575	.85	.45/.50
Los Angeles	1.10	1.10	1.125	1.25	1.25	.625	.625
Minneapolis	1.375	1.25e	1.50	1.40	1.50f	.85	.85
New Orleans	1.00	.75/1.00	1.00/1.25	1.00	1.00	.30/.40	.30/.40
New York	1.886b	1.75b	1.925	2.00b	2.00c	.95	.875/.95
Philadelphia	1.50	1.00	1.375	1.50	1.375	.40/.50	.40/.50
Pittsburgh	1.75	1.50	1.50	1.25	1.75	.80	.70
St. Louis	1.50	1.25	1.75	1.57/1.75	1.50	.875	.45/.875
San Francisco	1.75c	1.50	1.50	1.50	1.50cd	.75	.60
Seattle	1.60c	1.25c	1.50c	1.50c	1.60c	.90c	1.00c
Montreal	.80	.70	.75	.70	.80	.40	.35

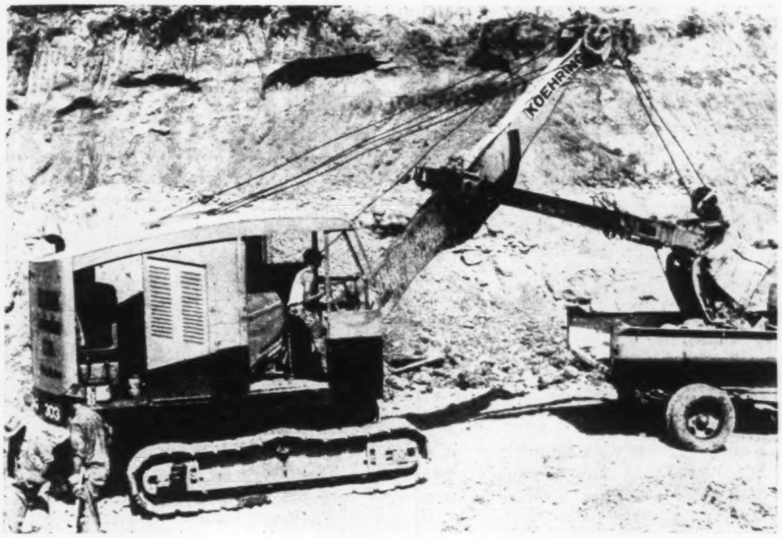
a PWA *b* 7 hr. day. *c* 6 hr. day. *d* On strike for $1.75/hr. *e* 35 hr. wk. 30 hr. wk.



ENR Skilled Average: (Bricklayers, Carpenters, Iron workers) $1.378
ENR Common Average: $0.676.

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Light Weight Shovel

The new Model 303 ¾-yd. excavator being placed on the market by Koehring Co. of Milwaukee has achieved a combination of heavy duty construction and light weight by the use of high strength special steels combined with welded construction and simplified design. The 303 is fully convertible, with a 1 yd. rating as a crane or dragline.

A simple gear shift provides two selective swing speeds, and two traction speeds are provided to meet varying conditions. Safety glass is installed in the cab to protect the operator.

Easy accessibility is a feature of this machine, each shaft being independently removable and the drums being equipped with quickly removable barrels.

Air Compressors

A new line of air compressors, in sizes ranging from 75 to 300 hp. which, although designed for permanent heavy-duty work, are said to be adaptable for locations which may not be permanent, is being offered by the Worthington Pump & Machinery Corp., of Harrison, N. J. These compressors, which are gas engine powered, are of the four-cycle angle type, and are known as Type LCE.

The compressors are built with one to four compressor cylinders, corresponding to 75 to 300 hp. All compressor cylinders are horizontal and at right angles to the power cylinders, each compressor cylinder having two corresponding power cylinders. The compressor element can be arranged to deliver any combination of volume and pressure within the limits of the engine rating. The compressor cylinders are of the standard Worthington design and are fitted throughout with lightweight feather valves. Large water jackets and close clearances are said to give high volumetric efficiencies.

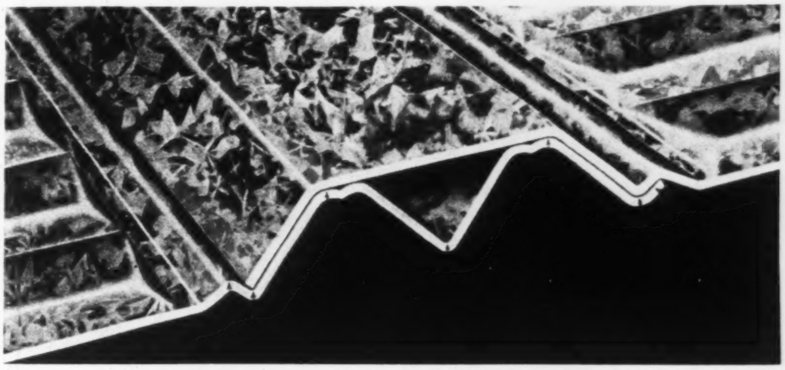
The engine is a vertical, four-cycle type, and engine and compressors are force feed lubricated throughout. The company attaches special importance to the fact that most parts are interchangeable; thus, for instance, the engine and compressor connecting rods are identical.

The units are shipped in one piece, and for installation it is only necessary to skid them over the bolts, level, and grout them.

Free Parking Meter

A device intended to combine the advantages of free parking with control by parking meter is the Parken Free Parking Regulator, distributed by the Tidewater Mfg. Co., of Jacksonville, Fla. The motorist using the Parken meter starts the mechanism when he parks his car. When he leaves he inserts a coin into the machine; if he has stayed less than a predetermined free parking period the coin is returned to him. If, however, the moving hand on the meter has moved past the free parking section into the illegal parking section the coin will be retained as a fine. If the car has been parked beyond the fine period, the hand moves into a police ticket zone.

The regulator consists of a spring-driven timing mechanism which controls the movement of an indicator hand across a charted dial showing through a glass window on the face of the regulator. A coin-controlled mechanism starts and stops the timing mechanism.



New Roofing Sheets

The Republic Steel Corp. of Cleveland has introduced a new roofing sheet under the trade name of Republic Perfected Triple Drain Channel Roofing. The chief feature of the new sheet is the use of four ridges and three valleys in each channel unit, instead of the conventional one or two. This innovation prevents either driving rain or capillary attraction from causing leaks.

A beaded channel makes a tight fit at the overlapping edge, creating a vacuum action. Any rain passing this point is carried into the center channel through gravity action.

The proper area for nailing Triple Drain roofing is indicated by blue lines on each sheet. Triple Drain is available in three types of metal: steel, copper-bearing steel, and rust-resisting Toncan iron.

Diesel Compressor

The Chicago Pneumatic Tool Co. has introduced a 700-cu.ft. per min. diesel-driven compressor. The compressor is furnished either as a portable unit, class WO-2, or arranged for mounting on a permanent foundation or on skids, class W-CO.

The class WO-2 consists of the Chicago pneumatic type 48 vertical, four-cylinder, four-cycle, medium-speed diesel engine on a common crankcase and crankshaft with a V-type two-stage, double-acting, water-cooled compressor, all on a structural steel deck arranged for mounting on skids or on wheels.

Regulation of the air capacity is achieved by means of a pneumatic throttle giving three-step regulation. When the pressure rises to a certain point the inlet valves at one end of each cylinder are held open, reducing the capacity one-half, and the engine speed is cut about one-half. With a further increase in discharge pressure, the compressor is completely unloaded. Starting of the motor is accomplished by means of a small four cylinder gasoline engine operating through a Bendix arrangement.

The class W-CO uses the same engine and compressor as the class WO-2 but is differently mounted. It is built in sizes having three or four engine cylinders rated 112½ and 150½ hp., respectively, and with respective capacities of 655 and 830 cu.ft. per min. at 100 lb. pressure. Compressor cylinder sizes are also available for other operating conditions. The W-CO is started by compressed air, a small gasoline engine driven air starting device being included in the standard equipment.

• • •

Flexible Metal Hose

A new design of seamless flexible metal hose has been developed by the Seamlex Co., Long Island City, N. Y. Instead of having the usual external metal braid to provide for elongation under internal pressure, the new T.S.T. Triple Safe Tubing has the braid embedded between two corrugated seamless tubes, forming an all metal jointless and packless hose. This arrangement eliminates difficulties in cutting and attaching the braid.

A number of advantages are claimed for the new design. T.S.T. can be cut with a hacksaw like any ordinary pipe. Thus users may buy the tubing in lengths of about 12 ft., cut it to required length, and attach fittings in a few minutes. Male or female pipe thread fittings consist of only two parts and do not require soldering, brazing or packing; only a vise, a wrench and a file are necessary for attaching fittings.

T.S.T. tubing is made of a special non-corrosive bronze alloy particularly resistant to frequent bending and to vibration, or it can be made to order in aluminum. Standard sizes of ¼ in., 5/16 in., ⅜ in. and ½ in. I.D. are carried in stock.

• • •

Reinforcing Steel Institute Elects Secretary

The Concrete Reinforcing Steel Institute has announced the election of R. W. Johnson to the office of executive secretary. Mr. Johnson was previously employed by the Institute from 1927 until 1935, during the latter two years of which period he occupied the office of secretary.

• • •

Welding Newspaper

Publication of a monthly newspaper "Arc Welding Foundation News" has been begun with the October issue by the James F. Lincoln Arc Welding Foundation, organized some months ago.

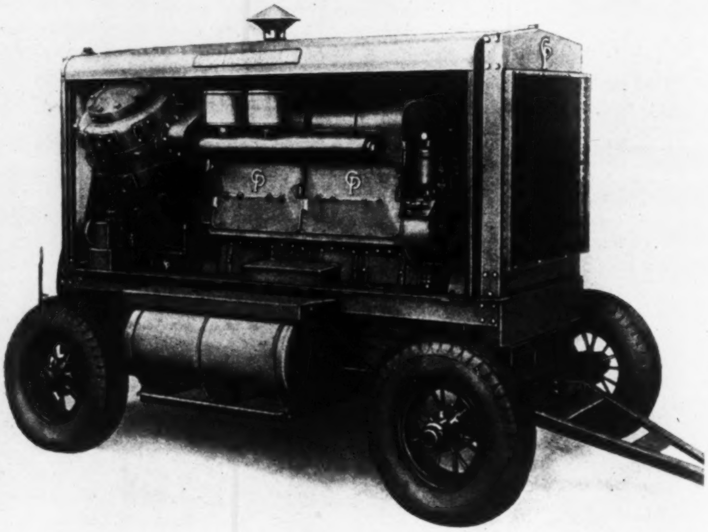
The first issue is largely devoted to the $200,000 prize contest for new arc welded designs which is being sponsored by the Foundation.

New Marketing Policy

The Hunter Steel Co., manufacturer of the Hunter safety railing, a safety highway railing for hazardous locations, which is said to act like a safety net through its continuous cable-like structure, has decided on a policy of selling the railing through established fabricators and ornamental iron works in various localities. This policy is intended to enable local companies to cooperate locally with architects and engineers who are figuring on construction where this railing would be advisable. In addition it is expected that delivery will be facilitated and a local source of supply provided in case certain sections of the railing become thin.

Cooperation of the engineering departments of the Hunter Steel Co. will be available to local fabricators or iron works as well as to local architects and engineers, but the Hunter Steel Co. will not bid competitively on the railing work against the local dealers or fabricators.

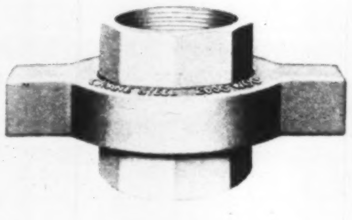
As this new policy was announced, the Hunter Co. was celebrating its fifth year of installation of the railing with a record of no crash-throughs and no fatalities. About ten miles of this railing have been installed during the five year period.



Compressor Weight Reduced

Weight savings up to 3,500 lb. in the gasoline powered models and as much as 8,000 lb. in diesel powered machines are said to have been achieved in the new line of "Utility" air compressors offered by Schramm, West Chester, Pa., in sizes ranging from 85 to 420 cu. ft. per min. air delivery.

Straight-in-line cylinder construction is used on all models, with force-feed lubrication to seven main bearings. Other features incorporated in all models include electric self-starting, self-aligning clutch between compressor and motor, mechanical intake valves, discharge valves occupying the entire area of the head, and a water cooled engine and compressor. Special attention has been given to achieving a modern streamlined appearance.



Temporary Pipe Union

Two new types of unions designed for use in piping systems requiring frequent quick dismantling, either to save time on the job or for emergency purposes, have been added to the line of the Crane Co., Chicago. Two types are offered, a forged steel screwed union with one set of lugs, and a similar union with two sets of lugs. The first type is shown in the illustration. In either union, a blow with a hammer upon the lug will break the joint without using a wrench.

The single lug union is made with forged steel tail pieces and thread pieces in sizes from 2 to 4 inches and has lugs on the union ring. The double lug union, with lugs on both the union ring and the thread piece, is made in sizes from 3/8 to 3/4 inch.

• • •

Speed Reducer Catalog

A catalog of mechanical speed reducers and motorized speed reducers was incorrectly stated in our issue of Sept. 16 to have been issued by the Austin Gear Works. The catalog was issued by the Boston Gear Works, Inc., North Quincy, Mass.

The catalog contains information on 14 types of motorized reducers and 14 types of mechanical reducers as well as engineering data on the selection of equipment.

NEW PUBLICATIONS

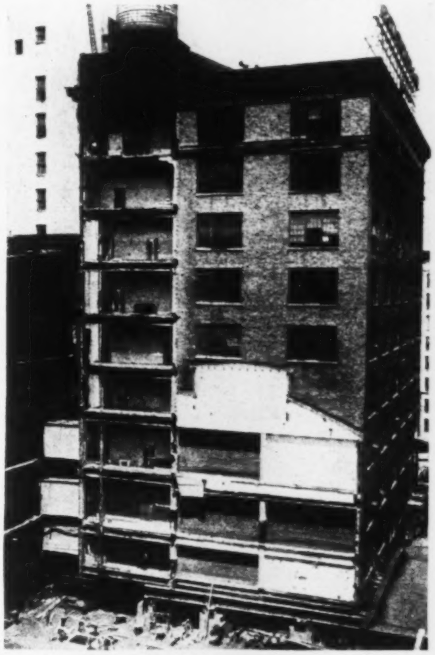
AN ATTACK on diversion of gasoline tax funds to other than highway purposes is contained in a new 16-p. booklet, "Straight Thinking About Highways."—Portland Cement Association, New York City.

BATTERIES for diesel engines are described in a new booklet, "Electric Starting of Diesels." A description of laboratory methods of research and experiment in the production of Exide Batteries is included.—The Electric Storage Battery Co., Philadelphia.

A DISCUSSION of the "Simplex" system of water aeration is provided in a Simplex bulletin, A-13-37.—Simplex Ejector and Aerator Corp., Chicago.

Change of Address ONLY

BUSINESS AND PROFITS CONTINUE AS USUAL



The Brown-Thomson Building—in Hartford, Connecticut—as it was being moved by the Eichleay Engineering Corporation.

THIS nine story department store building—an 83 feet by 140 feet brick and steel frame structure weighing eight thousand tons—was moved a distance of 112 feet and pivoted 3 feet.

The store remained open and conducted business as usual, without interruption. Water, electricity, telephones, steam heat and sanitary services were continuously maintained . . . and two elevators were in use during the shopping days.

Here is positive proof that it is not necessary to demolish buildings when preparing for alterations, additions, changes of grade, street widening or clearing sites for the erection of new structures. Why waste time and money wrecking property when it can be shifted intact and remain occupied during the operation? . . . *rents and services continue as usual.*

Eichleay Engineers have had many years of experience in accomplishing jobs like this . . . projects that seem to be impossible. That is because they are specialists in handling this type of work. They offer their services in the solution of any moving problems—large or small—you may encounter.

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● BUILDING MOVING ● UNDERPINNING
● MACHINERY MOVING ● SHORING
● FOUNDATIONS ● RIGGING

WRITE TODAY for illustrated literature on any of the Eichleay services in which you may be interested . . . at no obligation, of course.

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Carey

HEAT-INSULATIONS . . .

Deliver Steam at 350 lbs. Pressure—700° F.
. . in unique Engineering Project

The pipes are weather-proofed by asphalt-saturated, close-weave, rag felt with mica surface held in place by galvanized iron wire.

From the power plant, the steam starts on its journey through 4900 feet of 14" pipe to The Champion Paper and Fibre Company's plant on the Houston ship channel.

Through forests . . . over bayous . . . above swamps and highways . . . a 4900 ft. pipe line carries its cargo of steam to the Champion Paper & Fibre Company's plant, on the Houston, Texas, ship channel.

The project consists of a 14-inch line for steam; a 4-inch return line for condensate. The steam line is insulated with 1½ inches of Carey Hi-Temp and 2 inches of Carey 85% Magnesia; the 4-inch line with 2 inches of 85% Magnesia.

Due to the high efficiency of Carey Insulations, the steam, which leaves the generating plant at 350 lbs. pressure, reaches the paper mill with an average pressure drop of only 6 lbs.

Engineers, and others interested in the transmission of steam, find that Carey Heat Insulations help to solve many problems which otherwise would be impractical. The benefits of Carey experience, covering over a half century, are available through a nationwide organization. Write for copy of Carey Insulation Handbook — address, Dept. 30.

Carey
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ASBESTOS
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PRODUCTS

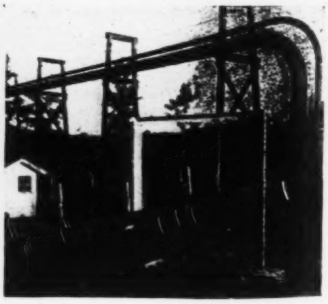
THE PHILIP CAREY COMPANY • Lockland, Cincinnati, Ohio

Dependable Products Since 1873

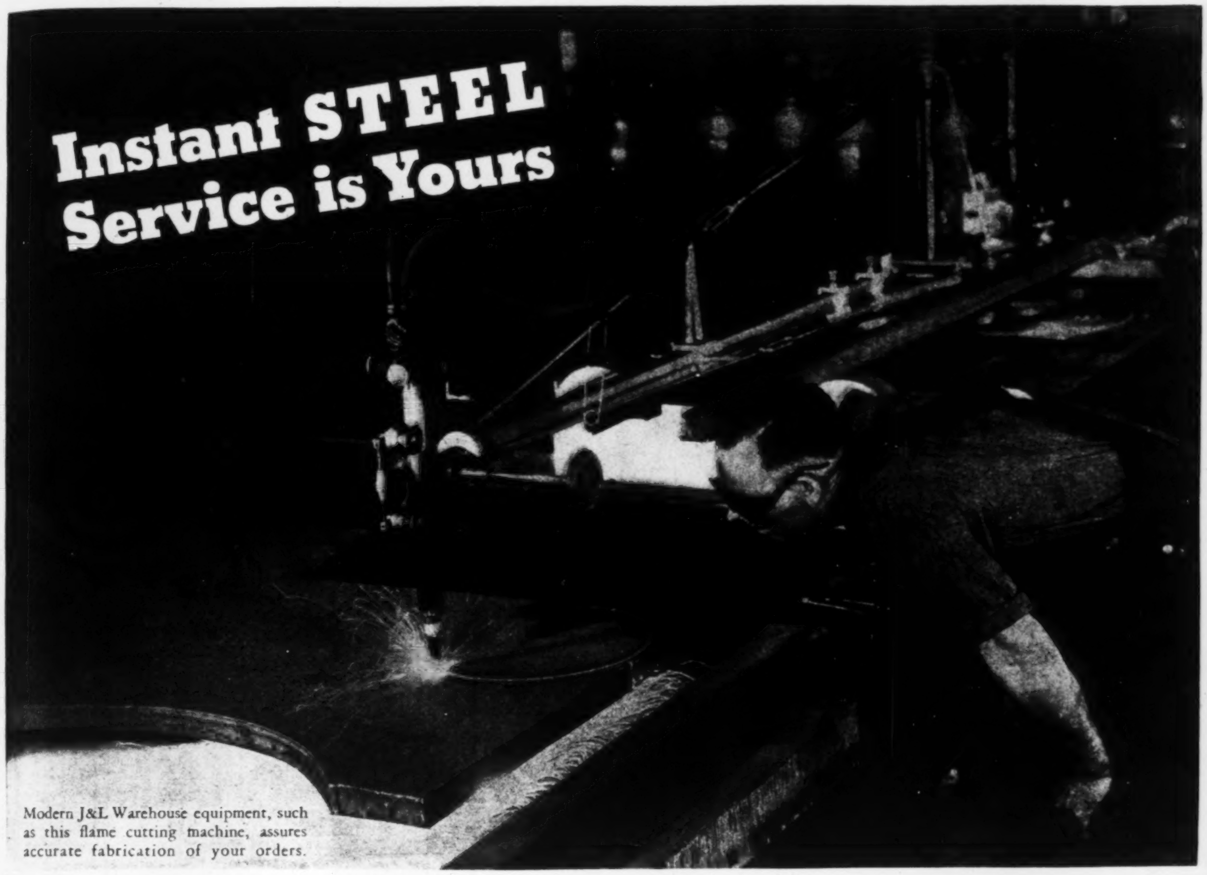
BRANCHES IN PRINCIPAL CITIES

Above highways and over bayous this pipe line is suspended from galvanized steel and timber frames.

The steam is delivered through this 14 inch line, insulated by 1½ inches of Carey Hi-Temp and 2 inches of Carey 85% Magnesia.



Through forests and over swamps the line winds to deliver the steam and return the condensate.



Modern J&L Warehouse equipment, such as this flame cutting machine, assures accurate fabrication of your orders.

. . . from your J&L WAREHOUSE

INCREASE YOUR PROFITS WITH J&L STEEL

When time means money to you . . . when emergency needs call for steel products in *ready-for-use form* . . . rely on your Jones & Laughlin Warehouse. Many alert contractors know from profitable experience that J & L warehouse service saves many costly delays . . . is the most dependable answer to their emergency needs for steel.

J & L Warehouses are conveniently located. They carry complete and diversified stocks of high-quality steel products . . . and are fully equipped for cutting, bending, forming, welding and fabricating steel. Jones & Laughlin Warehouses will meet your *exact* requirements for strength, safety and service.

A staff of competent engineers and designers, equipment for special emergency work, and adequate delivery facilities mean that you get the steel you need . . . in ready-for-use form . . . *on time.*

Rely on Jones & Laughlin for emergency steel service. You will find that your work will move steadily forward . . . that you save time and money. Buy your steel from J & L Warehouses.

JONES & LAUGHLIN STEEL CORPORATION • PITTSBURGH

MAKERS OF HIGH QUALITY IRON AND STEEL PRODUCTS SINCE 1850

J&L WAREHOUSES

PITTSBURGH	CINCINNATI	DETROIT	NEW ORLEANS	CHICAGO
26th and Jane Sts. Hemlock 1000	5th and Vine Sts. Main 2324	3289 Beaufait Ave. Plaza 0470	North Miro and Japonica Sts. Franklin 1131	2250 W. 47th St. Virginia 1600

NEW YORK, 30-44 Review Ave., Long Island City . . . New York City, Ironsides 6-8700 . . . Jersey City, Bergen 4-2994 . . . Newark, Market 3-2994
Operated by Jones & Laughlin Steel Service, Inc., formerly National Bridge Works

MEMPHIS, 1 Auction Ave.—5-1625 . . . Distributing Warehouse for Pipe, Sheets, Spikes and Wire Products. Reinforcing Bar Warehouse and Fabricating Shop

FOR EVERY NEED . . . THE RIGHT QUALITY OF STEEL IN A FULL RANGE OF SIZES

(Contract Unit Prices continued from page 652)

COLORADO HIGHWAYS

OWNER: U. S. Bureau Public Roads; J. A. Elliott, Engineer, Denver, Colo.

PROJECT: Grading and draining 2.027 miles of 28 ft. roadway on Boulder-Idaho Springs Highway, Roosevelt National Forest; base surfacing 1.242 miles of 26-ft. roadbed on Berthoud Pass Highway, Arapaho National Forest.

BIDDERS: Eleven bids were opened for the first project, and six for the second on August 17, 1937, with proposals ranging respectively from $86,691 to $110,907, and from $34,958 to $51,127.

LOW BIDDERS:

I—Boulder-Idaho Springs Highway

1. Hamilton-Gleason Co., Denver, Colo. (contract)	$86,691
2. Platt, Rogers, Inc., Pueblo, Colo.	88,429
3. Pioneer Constr. & Engr. Corp., Denver, Colo.	89,700

II—Berthoud Pass Highway

1. DeRemer & Atchison, Denver, Colo. (contract)	34,958
2. Brown-Schrepferman & Co., Denver, Colo.	38,757
3. Blanchard Bros., Denver, Colo.	43,288

I — BOULDER-IDAHO SPRINGS HIGHWAY

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clear	16 acre	$50.00	$75.00	$70.00
2. Grub	8 acre	25.00	50.00	50.00
3. Excav. unclass.	134,000 c. y.	.48	.50	.50
4. Excav. structural, unclass.	600 c. y.	1.00	1.50	1.25
5. Excav. borrow, unclass.	8,000 c. y.	.35	.30	.40
6. Overhaul	180,000 c. y.	.02	.02	.02
7. Finish earth graded road	2.151 mile	400.00	300.00	250.00
8. Concrete, cl. A	263 c. y.	23.00	20.00	22.00
9. Reinf. steel	28,300 lb.	.06	.06	.065
10. Stone masonry, cem. cl. A.	60 c. y.	23.00	20.00	17.00
11. C. g. s. m. pipe, 24 in.	860 l. f.	2.75	2.50	2.85
12. C. g. s. m. pipe, 30 in.	56 l. f.	3.30	3.50	3.70
13. C. g. s. m. pipe, 36 in.	244 l. f.	5.10	5.00	5.45
14. Perf. c. g. s. m. pipe, 6 in.	300 l. f.	1.50	1.50	1.10
15. Conc. maintenance posts	12 ea.	7.00	5.00	6.00

II — BERTHOUD PASS HIGHWAY

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excav. unclass.	6,200 c. y.	$0.60	$0.40	$0.60
2. Structural excav. unclass.	500 c. y.	2.50	3.00	2.00
3. Special overhaul	16,000 sta. y.	.02	.02	.05
4. Special overhaul	1,600 c. y.	.15	.20	.20
5. Heavy base course, No. 3	35,000 ton	.45	.60	.70
6. Watering	1,000 m. gal.	3.00	1.50	2.00
7. Roller operation	300 hr.	3.50	3.00	4.00
8. Furnish roller	1 ea.	500.00	350.00	100.00
9. Water plant	1 s.	100.00	150.00	100.00
10. Crusher run top course	3,000 ton	.75	1.00	.90
11. Concrete, cl. A	132 c. y.	22.50	22.50	22.50
12. Reinf. steel	12,300 lb.	.06	.07	.06
13. Stone masonry, cement cl. A	20 c. y.	22.50	30.00	30.00
14. C. g. s. m. pipe, 24 in.	496 l. f.	2.75	3.50	2.75
15. C. g. s. m. pipe, 30 in.	68 l. f.	3.50	4.00	3.50
16. Cast iron frames, gratings	350 lb.	.10	.10	.07
17. Conc. maintenance posts	7 ea.	7.50	5.00	6.00
18. Remove old structures	L. S.	750.00	350.00	600.00
19. Relay c. g. s. m. pipe	150 l. f.	1.00	1.00	2.00

INTERCEPTING SEWER, NEW YORK

OWNER: City of New York; Department of Sanitation; W. D. Binger, deputy commissioner in charge of engineering; R. H. Gould, chief engineer of sewage disposal.

PROJECT: Ditmars Blvd. intercepting sewer, 5,000 ft. long, an addition to the existing system of sewers serving North Beach screening plant in Queens. It will collect flow from existing sewers now discharging into west side of Flushing Bay, and will be a link in extensive future improvements.

CONDITIONS: Contract time, six months. Average depth of cut 15 ft., maximum 40 ft. About 60 per cent of excavation expected to be wet enough to require pumping. Little cutting and replacement of paving, as sewer mostly traverses unpaved streets.

BIDS: Seven bids were received July 9, range $304,584 to $455,942. Contract awarded Aug. 11.

LOW BIDDERS:

1. Arthur A. Johnson-Necaro Co., Inc., New York (contract)	$304,584
2. Nicholas Di Menna & Sons, Inc., New York	311,036
3. Slattery Contr. Co., Inc., and Di Salvo Contr. Co., New York	365,648

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Reinf. conc. sewer, 10x9 ft.	1,550 l. f.	$65.00	$59.10	$70.00
2. Reinf. conc. sewer, 8.25x9 ft.	132 l. f.	58.00	56.20	67.00
3. Reinf. conc. sewer, 7.75x9 ft. on piles	613 l. f.	50.00	47.25	55.00
4. Reinf. conc. sewer, 5.5x9 ft. on piles	243 l. f.	34.00	36.25	48.00
5. Reinf. conc. sewer, 5.5x9 ft.	433 l. f.	46.00	42.80	50.00
6. Reinf. conc. sewer, 5.5x7 ft. on piles	745 l. f.	32.00	33.35	44.00
7. Reinf. conc. sewer, 5.5x7 ft.	883 l. f.	54.00	78.35	75.00
8. Chamber A	L. S.	3,214.00	3,410.00	2,660.00
9. Chamber B	L. S.	3,613.00	3,958.00	3,490.00
10. Chamber C on piles	L. S.	3,032.00	3,418.00	2,030.00
11. Chamber D on piles	L. S.	2,508.00	1,744.00	1,620.00
12. Chamber E	L. S.	2,953.00	1,725.00	2,680.00
13. Chamber F	L. S.	2,953.00	1,769.00	2,880.00
14. Manholes, Type C	200 v. f.	19.00	13.50	28.00
15. Manholes, Type F	250 v. f.	26.00	17.00	30.00
16. Culvert	L. S.	4,522.00	3,334.50	7,270.00
17. Alt. 82nd St. weir chamber.	L. S.	2,556.00	1,250.00	2,910.00
18. Alt. 22nd Rd. weir chamber.	L. S.	2,094.00	400.00	1,910.00
19. Spurs, c.b. and house conn.	160 ea.	4.50	10.00	8.00
20. Risers	92 v. f.	3.50	5.00	5.00
21. Foundation timber	70 Mfbm.	119.00	110.00	150.00
22. Wood piles	27,000 l. f.	.65	.70	.60
23. Broken stone ballast	10 c. y.	4.50	5.00	3.00
24. Timb. shtg. left in place	410 Mfbm.	.01	10.00	30.00
25. Excav., rock, old masonry	10 c. y.	5.00	5.00	5.00
26. Add. fill for embankment	400 c. y.	1.00	.50	.50
27. Add. earth excav. above El. 0,0	50 c. y.	1.00	1.00	.60
28. Add. earth excav. below El. 0,0	50 c. y.	2.00	3.00	2.00
29. Add. concrete, cl. A	10 c. y.	15.00	10.00	15.00
30. Add. steel reinf. bars	6,000 lb.	.06	.06	.07

OUTFALL SEWER, BUFFALO

OWNER: Buffalo Sewer Authority, Buffalo, N. Y.; Greeley & Hansen, Engineers.

PROJECT: Construction of outfall conduit and overflow structure in Niagara River on west side of Bird Island, as part of Buffalo, N. Y., intercepting sewer and sewage treatment project.

BIDS: Four bids were opened in August, 1937, ranging from contract low of $110,320 to $191,040, both extremes based on steel outfall construction. Alternatives submitted on concrete outfall structure ranged from $113,603 to $136,743.

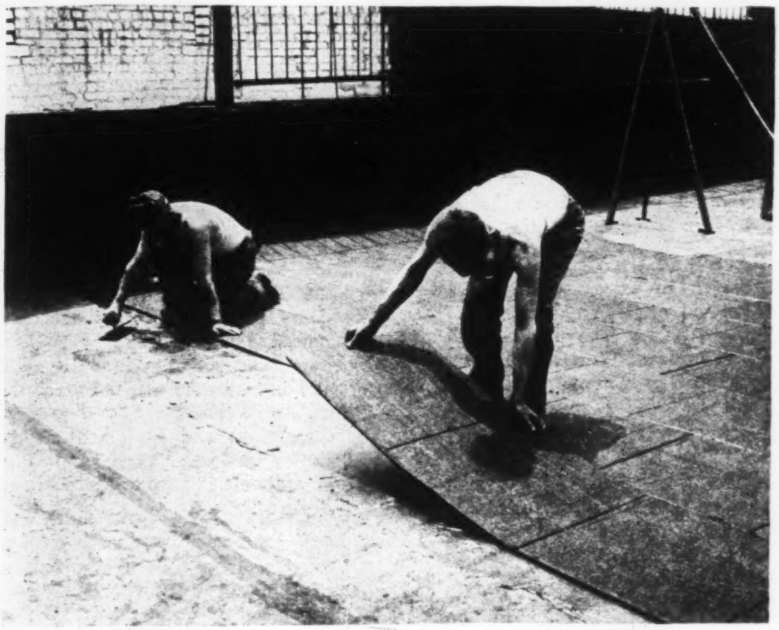
LOW BIDDERS:

1. McLain Construction Corporation, Buffalo, N. Y. (steel) (contract)	$110,320
2. Great Lakes & Dock Co., Buffalo, N. Y. (concrete)	113,603
3. L. A. Wells Construction Co., Cleveland, Ohio (concrete)	136,743

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Outfall structure alternatives				
(Steel construction	L. S.	$100,190.00	....	
(Concrete construction)	0 L. S.	....	$102,989.00	$119,000.00
2. Earth excav. add. dry	200 c. y.	2.00	0.95	7.90
3. Earth excav. add. wet	500 c. y.	3.50	1.00	7.90
4. Rock excav., dry	20 c. y.	8.00	1.00	7.90
5. Concrete, Cl. A-1	20 c. y.	20.00	32.00	25.00
6. Rock excavation, wet	100 c. y.	10.00	1.00	7.90
7. Concrete, Cl. A-2	30 c. y.	11.00	25.00	23.00
8. Concrete, Cl. B	50 c. y.	10.00	13.00	20.00
9. Reinf. steel	5,000 lb.	.04	.08	.04
10. Wood sheeting	2 M.b.m.	20.00	163.00	75.00
11. Steel sheeting	25,000 lb.	.05	.02	.02
12. Fill, selected	100 c. y.	1.00	1.50	1.00
13. Concrete in bags	250 c. y.	16.00	25.55	32.50

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



New Roofing Sheet for Wearing Course

A new product just put in production by the Celotex Corp., Chicago, Celotex Traffic Top, is designed as a protection course for waterproofing and for use under wood block flooring. It can also be used as a promenade or traffic surface for flat roofs, playgrounds and basement floors. As a promenade surface on roofs, it eliminates the hazard of duck boards and cat walks. Under block floors the resilient surface of Celotex Traffic Top deadens the noise of foot traffic and also prevents penetration of noise through to the floor below.

Celotex Traffic Top is treated against destruction by termites and dry rot by the patented Ferox process, and the asphalt gives it added protection against moisture.

Traffic Top is available in thicknesses of $\frac{1}{4}$ in. and $\frac{1}{2}$ in. and in boards 2 ft. by 4 ft. It is light in weight and passes fire brand tests.

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EQUIPMENT IN BRIEF

A **Thread Cutting** screw for use in metals and plastics has been developed by the Shakeproof Lock Washer Co., Chicago. An advantage of this screw is that it uses standard machine screw threads, and if it is necessary to replace the screw an ordinary machine screw of the same size will fit the thread which the Shakeproof screw has cut.

A **Caulking Gun** embodying a ratchet mechanism has been added by the Albion Mfg. Co., Philadelphia, to their line of smooth rod and push type guns. Except for the ratchet rod, the new gun embodies the same features as the previous guns in the line. A choice of fourteen different style nozzles is provided.

An Eraser assembly consisting of a holder and two types of refills, one of Fiberglass and the other of Rubberglass, known as the Rush-Eraser, is shortly to be placed on the market by The Eraser Co., Inc., Syracuse, N. Y.

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Pipe Layout Chart

A chart which permits easy layout of pipe angles, offsets and saddles is being placed on the market by the Victor Equipment Co., San Francisco, Cal. It is said that these charts will easily answer every type of pipe angle question, giving dimensions and angles in pipe offsets and pipe saddles, as well as for compound offsets, without any necessity for mathematical computations.

The chart is available in two sizes, $20\frac{1}{2}$ in. square for use in shop and workroom and one-half that size for field use. The chart is accompanied by a manual which explains its application.

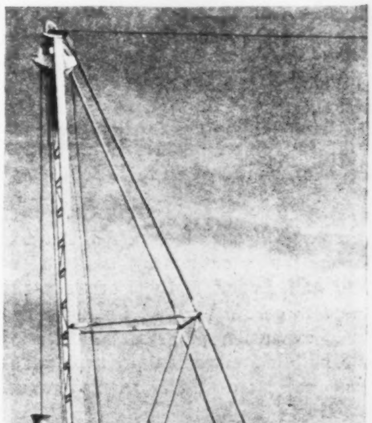
• • •

Lightweight Drill

A compact all-welded steel prospecting drill, the 23-P, has been developed by Bucyrus-Erie Co., of South Milwaukee. Light in weight and easily transported, this well-type drill was built especially for placer test hole work in obtaining samples of gold and other minerals, but the company believes that it should prove of value in foundation exploratory work.

Pipe driving and pipe pulling are provided for in the 23-P by a special spudding beam having two positions for the pitman connection. One position gives the machine a rapid downstroke for pipe driving, and the other position produces a powerful up-stroke for pipe pulling.

Outstanding features include easy control of drilling operations, a geared hoist and worm feed on the bull reel, all-steel derrick with 8-point pipe bracing, a rubber shock-absorber, and wheel or truck mounting for maximum mobility.



MANUFACTURERS' ACTIVITIES

A New Firm, Whitehead-Comley, Inc., has been formed in Philadelphia to handle the rental and sale of new and used construction equipment. The new company has a rebuilding plant located at the same address.

The Ruberoid Co. has acquired the physical assets of the Gold Seal Asphalt Roofing Co. at Minneapolis. The plant will continue the manufacture of asphalt roofing and shingles and will be provided with facilities for warehousing and distributing the complete line of Ruberoid building products.

The Wrought Washer Mfg. Co., Milwaukee, is celebrating the 50th anniversary of its founding.

The Central Foundry Co., New York, has purchased the property and equipment of the Bessemer Soil Pipe Co. at Bessemer, Ala. The Bessemer Co., which was a subsidiary of the N. O. Nelson Mfg. Co. of St. Louis, has been closed down for several years. No announcement has been made of plans for the use of the property.

The Michael Flynn Mfg. Co., successors to David Lupton's Sons Co., are continuing the manufacture of Lupton steel window products in the original plant, using the same basic designs and generally the same steel shapes used by the former Lupton Co.

Murphy Diesel Co., Ltd., Milwaukee, is now in production in its own plant manufacturing heavy-duty industrial full diesel engines in 4- and 6-cylinder models of 50 to 175 hp.

The Producers' Council, Inc., composed of manufacturers of building material and equipment, has retained Marshall Adams and his organization, the George N. Wallace Co., to direct their expansion program and develop the building extension program which was voted in their recent annual meeting.

Personnel Changes

A. R. Johnson has been appointed manager of the merchandising sales division of Cutler-Hammer Co., Milwaukee, and will be in charge of all distributor activities. Mr. Johnson has been with Cutler-Hammer since 1917 and has most recently been manager of the Detroit sales office.

The Board of Directors of Link-Belt Co., Chicago, has named William C. Carter and Edward J. Burnell vice-presidents. Mr. Carter came up through the engineering and production departments and has recently been in charge of company production. Mr. Burnell's experience was mostly in sales, but he has lately been general manager of the Pershing Road, Chicago, plant.

The New general superintendent of the Kron Co., Bridgeport, Conn., is Herman L. Tygesson, who has joined the organization to take that position.

Appointment of W. R. Persons as manager of its Pittsburgh welding sales and engineering office has been announced by The Lincoln Electric Co., Cleveland, Ohio. Mr. Persons has been in the Pittsburgh office since 1934.

Distributor Appointments

John McC. Latimer has been appointed exclusive representative of the western Pennsylvania territory by Lukenweld, Inc., a division of Lukens Steel Co., Coatesville, Pa.

Kron industrial scales will be distributed in Philadelphia for The Kron Co., Bridgeport, Conn., by J. A. Hunt Co.

The Michael Flynn Mfg. Co., Philadelphia, has appointed the Fireproof Products Co., New York City, as distributor in the metropolitan district of Lupton Steel windows and kindred products.

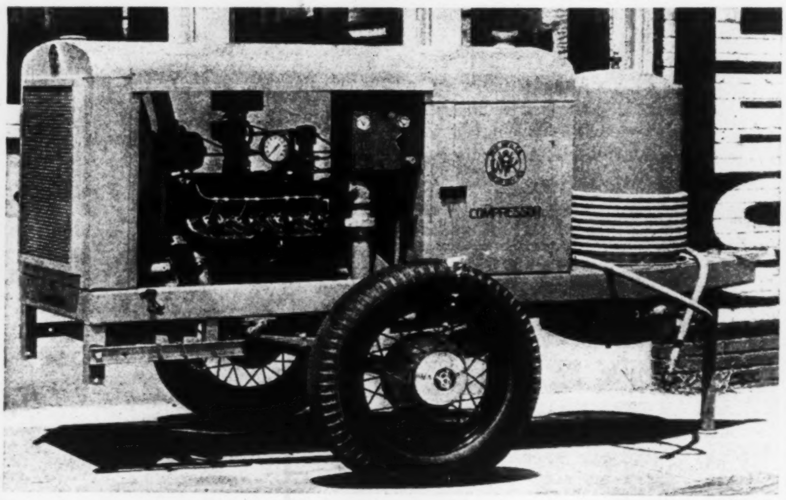
The Fafnir Bearing Co., New Britain, Conn., has recently appointed three new distributors: The Mountain States Machine Shops, of Logan, W. Va.; the Oil City Iron Works, of Corsicana, Texas; and Ferebee-Johnson Co., of Lynchburg, Va.

The George H. Soule Co., of St. Albans, Vt., has been appointed a distributor of Armco ingot iron by the American Rolling Mill Co., Middletown, Ohio.

Plant expansion

The Tractor Division of Allis-Chalmers Mfg. Co., Milwaukee, has announced a $4,000,000 expansion program. The program includes additional buildings and equipment at the West Allis Works for tractor production, buildings and equipment at the La Crosse implement plant, and additional equipment at the Springfield and La Porte plants.

Low Freight Costs and an improved layout have been achieved by the transfer of the plant and offices of the Penn Electric Switch Co. to a new group of industrial buildings at Goshen, Ind. The company was previously located in Des Moines. The new plant includes a two-story office building and a one-story factory building 210x340 ft.

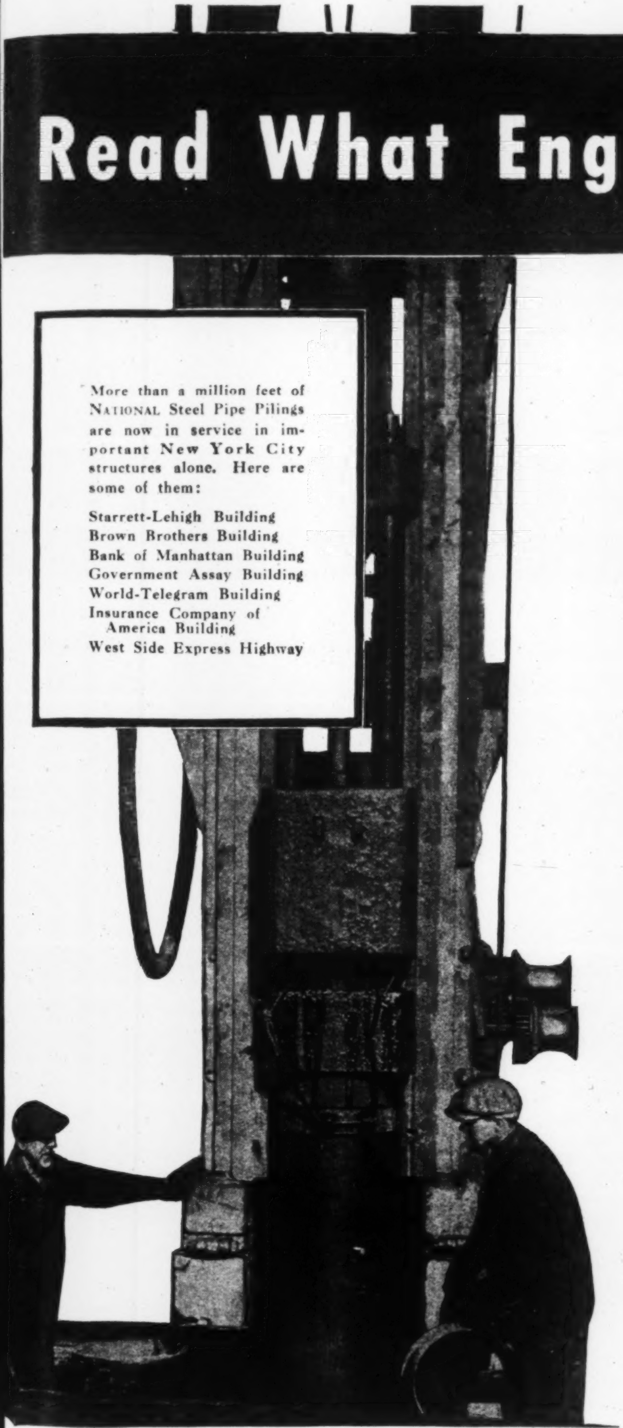


Lightweight Compressor

Portability, simplicity and economy are the features claimed for the new W-K compressors manufactured by the W-K Mfg. Co., Kansas City, Mo. The new compressors, powered with a Ford V-8 engine, are made in a Utility model with 70 cu.ft. capacity and in a Mogul model with 140 cu.ft. capacity.

The Utility model weighs 900 lb. on skids or 1,300 lb. on wheels and sells on wheels for $1,200. The Mogul weighs 1,600 lb., or 2,190 lb. on wheels. This model sells on wheels for $1,750.

Read What Engineers Report



More than a million feet of National Steel Pipe Pilings are now in service in important New York City structures alone. Here are some of them:

- Starrett-Lehigh Building
- Brown Brothers Building
- Bank of Manhattan Building
- Government Assay Building
- World-Telegram Building
- Insurance Company of America Building
- West Side Express Highway

...*on* National Steel Pipe *for Piling!*

"IT PENETRATES WHERE OTHER PILINGS FAIL"

When contractors placed foundations for New York's new West Side Express Highway, old bulkheads, cribs, docks, and boulders buried in the fill made the driving tough — so tough that as many as 760 blows from a 5000-pound steam hammer were needed to penetrate a single foot. They tried many types of piling, but only National Steel Pipe could stand this hard driving without failure.

"IT HAS GREATER SUPPORTING STRENGTH"

New York City's Building Code recognizes superior load-carrying capacity in concrete-filled steel pipe piling . . . allows 132-ton loading for each 18″ x ½″ pile more than 60′ long, driven to refusal on bed rock. Code permits close spacing, making possible greater over-all loads per unit area.

"IT COSTS FAR LESS THAN CAISSON WORK"

National Steel Pipe Piling requires little excavation . . . can be driven faster than caissons and to practically any depth . . . often 200 feet or more. It has entirely supplanted costly pneumatic caisson work for modern deep-foundation construction.

"IT CAN BE INSPECTED, FULL LENGTH, AFTER DRIVING"

After National Steel Pipe Piling is driven to refusal and cleared, you can inspect it, top to bottom, by merely lowering an electric light . . . a direct and simple method of determining exactly what has happened below the surface . . . taking the guesswork out of foundation construction.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

UNITED STATES STEEL

(Contract Unit Prices continued from page 692)

SOUTH DAKOTA HIGHWAYS

OWNER: U. S. Bureau Public Roads; J. A. Elliott, Engineer, Denver, Colo.

PROJECT: Bituminous surfacing of 3.978 miles of 26 ft. road bed on the Deadwood-Custer-Hot Springs Highway in Harney National Forest, South Dakota.

BIDS: Four bids were opened and contract awarded in August 1937, with proposals ranging from the low of $67,436 to a high of $75,151.

LOW BIDDERS:

1. Northwestern Engineering Co., Rapid City, S. D. (contract)	$67,436
2. Summit Const. Co., Rapid City, S. D.	73,237
3. Peter Kiewit Sons Co., Omaha, Neb.	74,963

			Unit Prices	
Item	Quan.	(1)	(2)	(3)
1. Excav. unclass.	8,000 c. y.	$0.98	$1.60	$1.60
2. Struct. excav. unclass	150 c. y.	2.00	2.00	1.50
3. Special overhaul	10,000 sta. y.	.03	.02	.03
4. Special overhaul	1,000 c. y. m.	.20	.20	.50
5. Heavy base course, 1½ in.	17,000 ton	1.65	1.70	1.70
6. Watering	500 m. gal.	2.00	4.00	2.00
7. Operate roller	150 hr.	3.50	4.00	4.00
8. Furnish roller	1 ea.	50.00	75.00	100.00
9. Water plant	L. S.	50.00	50.00	100.00
10. M. c. l. cutback asphalt	22,000 gal.	.13	.16	.12
11. Heavy retread, grading C	5,600 ton	2.44	1.70	2.90
12. Retread seal cover	500 ton	4.25	5.00	4.00
13. Cutback asphalt, RC-3	64,000 gal.	.12	.16	.11
14. Concrete, cl. A	60 c. y.	30.00	30.00	25.00
15. Reinforcing steel	1,000 lb.	.06	.06	.10
16. Reinf. conc. culvert, 18 in.	44 l. f.	2.00	1.75	3.00
17. Reinf. conc. culvert, 24 in.	44 l. f.	2.75	2.00	4.00
18. Reinf. conc. culvert, 30 in.	4 l. f.	3.50	3.00	5.00
19. Reinf. conc. culvert, 36 in.	16 l. f.	4.25	3.50	7.00
20. Reinf. conc. culvert, 48 in.	8 l. f.	4.60	6.00	12.00
21. Move, reconstruct wood guardrail	636 l. f.	.85	.30	.60

TUNNEL LINING, OREGON

OWNER: U. S. Engineers, Bonneville Project; Major Theron D. Weaver, Engineer.

PROJECT: Permanent lining for Ruckel Slide drainage tunnels, between Bonneville and Cascades Locks, Bonneville, Ore.

BIDS: Four bids were opened in August, 1937, ranging from a low of $43,763 to a high of $94,447, based on minimum hourly wage rates stipulated at $1.20 for skilled and 55c. for common labor.

LOW BIDDERS:

1. Sam Orino, Bonneville, Ore.	$43,763
2. Guthrie-McDougall Co., Portland, Ore.	70,854
3. Parker-Schramm Co., Portland, Ore.	80,855

			Unit Prices	
Item	Quan.	(1)	(2)	(3)
1. Excavation	240 c. y.	$12.00	$12.00	$4.00
2. Creosoted timber	425 M.b.m.	85.00	147.00	175.00
3. Corr. iron outlet, 30 in.	376 l. f.	4.00	3.50	3.50
4. Corr. iron outlet, 36 in.	32 l. f.	6.00	5.00	4.50
5. Timber backfill	52 M.b.m.	26.00	30.00	40.00
6. Outlet pipe backfill	360 c. y.	3.50	5.75	3.00
7. Shaft lining	45 l. f.	10.00	8.75	20.00

MISSOURI RIVER DIKES, NEBR.

OWNER: U. S. Engineer Dept.; Capt. H. B. Loper, District Engineer, Omaha, Neb.

PROJECT: Construction of 12,375 lin. ft. standard dikes and 645 ft. abatis in the Missouri River at Omaha Mission-Monoana Bends, near Omaha, Nebr.

BIDS: Eight bids were opened in July, 1937, ranging from $144,909 to $187,519. The Government furnishes all lumber, piles and crib timber estimated at $120,459.

LOW BIDS:

1. Woods Bros. Const. Co., Lincoln, Nebr.	$144,909
2. W. P. McGeorge, Pine Bluff, Ark.	158,789
3. Addison Miller, Inc., St. Paul, Minn.	163,761

PILE DIKE ITEMS

			Unit Prices	
	Quan.	(1)	(2)	(3)
1. Lumber fabric mattress	170 sq.	$5.00	$5.00	$6.00
2. Lumber mattress	10,136 sq.	3.40	3.90	4.60
3. Mattress, dike stone	12,850 ton	3.25	3.60	3.40
4. Hand paving stone	800 ton	5.50	4.75	6.00
5. Paving spalls	390 ton	3.00	3.60	4.00
6. Piles, stringers, braces	269,800 l. f.	.16	.17	.17
CRIB DIKE ITEMS				
7. Willow mattress	390 sq.	8.50	10.00	10.00
8. Crib, mattress stone	2,455 ton	3.30	3.60	3.30
9. Hand paving stone	135 ton	5.50	4.75	5.50
10. Paving spalls	65 ton	3.00	3.60	4.10
11. Deadmen	2 each	50.00	50.00	30.00
12. Crib poles	20 each	4.50	2.00	2.50
13. Place crib timbers	27,300 l. f.	.17	.20	.16
ABATIS ITEMS				
14. Lumber fabric mattress	130 sq.	5.00	5.00	7.50
15. Mattress stone	80 ton	3.30	3.80	4.00
16. Timbers	7 M.b.m.	85.00	.08	11
17. Wire fabric screening	100 sq.	2.30	2.50	3.00
18. Deadmen	35 ea.	5.00	3.00	10.00

LINCOLN TUNNEL APPROACH ROAD

OWNER: Port of New York Authority, O. H. Ammann, chief engineer.

PROJECT: Widening of 19th St., Weehawken, N. J., between Park Ave. and Willow Ave. for approach to Lincoln Tunnel. All work included except demolition of buildings. New street will be 75 ft. between curbs, paved with sheet asphalt on a concrete base; existing narrow concrete base may be utilized. Curbs will be of concrete, except at corners will be cast iron backed by concrete. Concrete sidewalks on both sides of street included. Considerable grading required north of new street. Drainage system to be connected to sewers.

CONDITIONS: Contractor is responsible for protection, maintenance, temporary relocation, permanent relocation and final restoration of all underground and overhead utilities. Overhead electric, telephone and fire alarm facilities to be done by owner or approved subcontractor at expense of contractor. Contract time limit Dec. 1, 1937. PWA minimum wage rates of $1.20 and 50c. govern, though project lies in Metropolitan union area and higher rates will undoubtedly prevail.

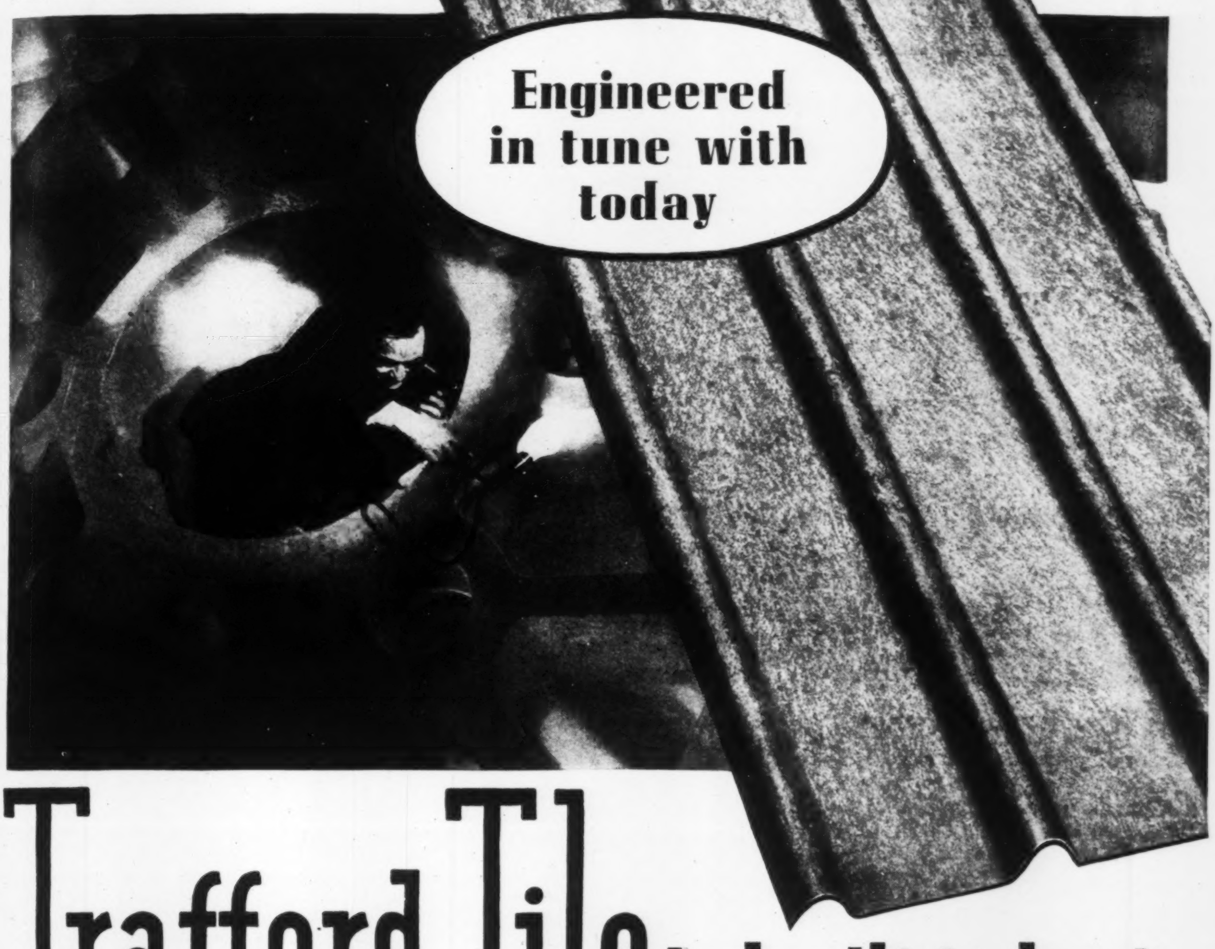
BIDS: Five bids were opened Aug. 10, 1937, ranging from $10,912 to $16,808. Contract awarded to low bidder.

LOW BIDDERS:

1. Clinton Asphalt Co., Union City, N. J. (contract)	$10,912
2. Geo. P. Scanlon, Inc., Jersey City, N. J.	11,991
3. N. J. Asphalt Paving Co., Jersey City, N. J.	14,557

			Unit Prices	
Item	Quan.	(1)	(2)	(3)
1. Excavation	1,100 c. y.	$0.40	$1.00	$1.30
2. Remove pavement	860 s. y.	.25	.25	.50
3. Remove conc. base	50 s. y.	.25	1.00	1.50
4. Earth fill, not trench	500 c. y.	.10	.60	1.25
5. Concrete	20 c. y.	20.00	30.00	25.00
6. Concrete pavt. base	1,150 s. y.	1.25	1.00	2.00
7. Concrete, base adj.	100 c. y.	5.25	5.50	8.00
8. Concrete curb	300 l. f.	1.20	1.25	1.25
9. Concrete curb, C. I. face	170 l. f.	4.50	5.00	5.00
10. Concrete sidewalk	600 s. y.	2.25	2.70	2.25
11. Portland cement	800 bbl.	2.33	2.40	2.75
12. Sheet asphalt pavt	2,050 s. y.	1.50	1.36	1.50
13. Reinf. steel	1,300 lb.	.07	.10	.10
14. Iron drain castings	1,600 lb.	.12	.13	.12
15. Vit. clay pipe, 12 in	90 l. f.	1.50	1.50	2.50

The back of the 200" mirror for the world's largest telescope at Mt. Palomar, Cal., illustrates how a scientific distribution of material creates strength.



Trafford Tile is built to last

GIVE an industrial building walls of Trafford Tile and you have almost imperishable sidewall construction. Resistant to fire, weather and climate. Rigid, rugged, with the time-tried endurance of asbestos-cement sheet, but with extra strength built in.

Extra strong because Trafford Tile is a product of advanced engineering design, with corrugations scientifically shaped and spaced to combine maximum strength with minimum weight.

Here is today's siding material for industrial construction, economical for temporary as well as permanent structures. Upkeep is reduced to a minimum, because no protective painting is needed. The appearance is that of Roman Tiling, in a pleasing gray color. Let our engineering staff advise you on the many applications of Trafford Tile.

KEASBEY & MATTISON COMPANY
AMBLER, PENNA.

K&M
best in asbestos

Send for information

KEASBEY & MATTISON COMPANY
Ambler, Penna.

Please send us detailed information on Trafford Tile.

Name________________

Name of Firm________________

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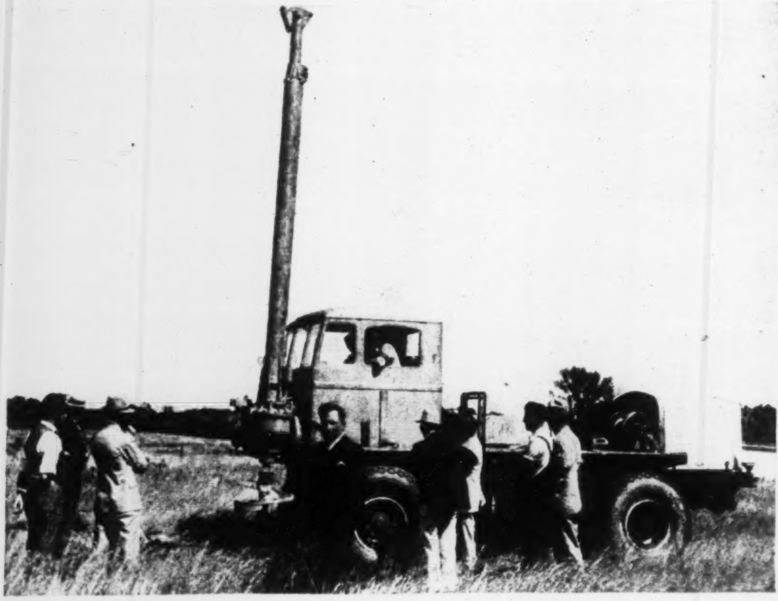
NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



One Man Boring Machine

One man operation is provided by the front mounting of the boring machine on the truck mounted unit recently developed by the Four Wheel Drive Auto Co., Clintonville, Wisc. The driver of the truck can operate both the truck and the boring machine from the cab. To facilitate mounting the boring machine on the front end, the motor of the truck is mounted in the rear. Considerable saving in time is said to be made in maneuvering, as the spot for drilling is in full view.

Features of the boring and pole setting unit include a hydraulic steering mechanism and a hydraulic spring lock which makes a rigid connection between the axles and the truck frame by opening a valve, providing a rigid unit when the boring machine is in operation. The tower of the boring machine is utilized together with a winch on the back for setting poles.

• • •

Larger Truck Battery

A battery, for use in electric material-handling trucks, with a capacity of 33 kw.-hr. has been developed by the Electric Storage Battery Co. of Philadelphia. The SLM-13 Exide Ironclad is a 16-cell battery assembled in a steel tray, requiring only 26 in. x 51 in. of floor space; each cell has a capacity of 1,080 amp. hours at the normal six hour discharge rate.

Welder's Clothing

Protective clothing for arc and acetylene welders has been added to the line of the Davis Emergency Equipment Co., New York City. The new line includes goggles, sleeves, aprons, leggings, spats and gloves as well as helmets and hand shields for arc welding. The goggles are furnished with glass of five different shades for different classes of work and the helmets and hand shields are furnished with three shades.

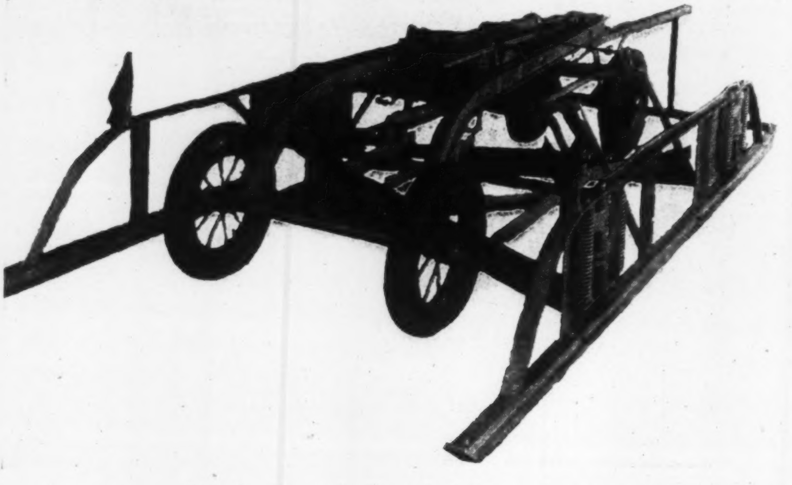
The clothing is supplied in three materials, fireproof duck, asbestos and chrome leather.

• • •

Alloy Steel Rod

A new gas welding rod, the Airco No. 1 High Ductility Alloy Steel, has been developed by the Air Reduction Sales Co., New York City. It has been designed to provide increased ductility and general improvement in quality of single and multi-layer steel welds.

A feature of the new rod is its ability to withstand considerable heating without burning.



High Speed Road Maintainer

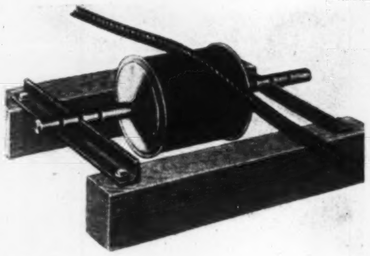
A new road machine developed by the Allen Road Machinery Corp. is said to operate at speeds up to 20 miles per hour without leaving windrows or corduroys. The company recommends the machine for any type of bladeable road, for laying black top and oil mats and, with a scarifier attachment, for preparing and shaping oiled roads for reshooting.

One-man operation of the device is provided by an automatic control by which the blade setting is controlled by the drawbar pull without changing the contour or crown of the road for which the machine has been set. This device automatically regulates the quantity of material carried in the blade, and permits the driver to devote his entire attention to driving. The company states that one man can complete 50 to 100 miles of road per day.

The machine is entirely controlled by hydraulic pressure. Raising blades for transporting from one road to another, or for setting of blades, is accomplished through a series of valves operated by a single pump. It is not necessary to lift blades when crossing bridges or culverts or when turning.

The Allen road maintainer is built

in two sizes. The standard machine, to be operated by a 1½ ton truck or farm tractor, is 7.5 ft. wide and weighs 2,100 lb. The deluxe machine, 10.5 ft. wide and weighing 3,500 lb., requires a four wheel drive or a 3 to 5 ton rear wheel drive truck, or an industrial type rubber tire tractor.



Wire Line Roller

A roller to be installed on cables wherever friction is encountered has recently been introduced by Patterson-Ballagh Corp., Los Angeles. The new roller, with permanently grease-packed shaft housings, needs no lubrication or attention, resists wear, and operates freely. Absence of metal to metal contact eliminates sparking.

The roller may be adjusted from side to side by moving the shaft to a different slot adjacent with the rails.

No wonder tires can't side-skid or cut!

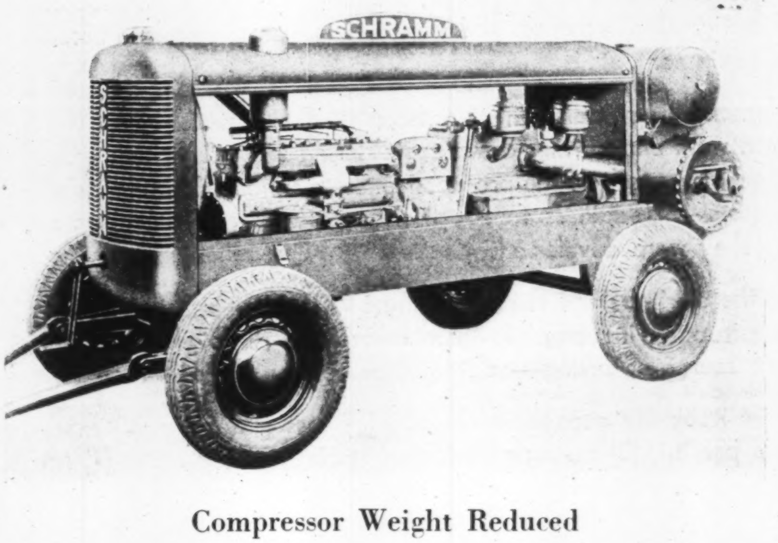
no steel at right angles to traffic direction

it's IRVING DECKING
The open steel mesh bridge floor

Jam on your brakes—and your car slides straight ahead a few feet—then STOPS—on Irving Decking. This pavement never collects snow, ice, oil or grease. Large UNITS easily, quickly, cheaply assembled into 1-piece job WITHOUT A JOINT. Lightweight; strong; safe; self-cleaning; low in maintenance cost—the perfect bridge flooring.

Send for Catalog F.200.

IRVING IRON WORKS COMPANY
LONG ISLAND CITY, NEW YORK
Originators of
IRVING SUBWAY GRATING

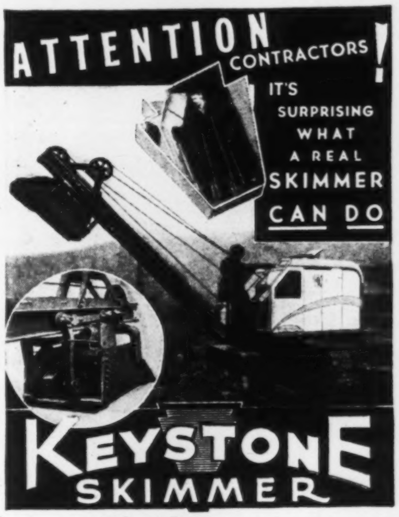


Compressor Weight Reduced

Weight savings up to 3,500 lb. in the gasoline powered models and as much as 8,000 lb. in diesel powered machines are said to have been achieved in the new line of "Utility" air compressors offered by the Schramm organization, West Chester, Pa., in sizes ranging from 85 to 420 cu. ft. per min. air delivery.

Straight-in-line cylinder construction is used on all models, with force-feed lubrication to the seven main bearings.

By an unfortunate error in the make-up of page 36 of the Oct. 7 issue the description of this machine was so placed in relation to a picture of a diesel compressor manufactured by the Chicago Pneumatic Tool Co. described on the same page as to give the impression that the story referred to that picture.



ATTENTION CONTRACTORS! IT'S SURPRISING WHAT A REAL SKIMMER CAN DO

KEYSTONE SKIMMER

MODEL 18A . . IS SMOOTH-"LIKE STEAM"

It has the "touch" and "feel" and cushion of a steam machine with the convenience of Gasoline, Diesel, or Electric Power.

Standard Boom - 21 ft. long. Boom for hard Digging - 18 ft. long. Boom for long reaches - 24 ft. long.

Capacities - 1 cu. yard and 1¼ cu. yard. Tripping device is electrically operated.

Investigate Keystone before you buy a skimmer.

KEYSTONE DRILLER CO., Beaver Falls, Penna.

TIMKEN
BITS

TIMKEN U.S.A. B2 P

REMOVE ROCK DRILLING HANDICAPS

You couldn't persuade a contractor who has once experienced the speed and economy of TIMKEN Rock Bits to go back to the use of forged steel. You might as well ask him to give up his modern motorized graders, scrapers and wagons in favor of obsolete horse-drawn equipment.

The tremendous strides that have been made in speeding up construction work and cutting down costs during the last fifteen years are largely the result of the progressiveness manifested by individual contractors—a readiness to adopt new methods and machines as fast as they were developed.

This is the spirit behind the big swing to TIMKEN Bits throughout the construction industry. In them users have discovered another valuable source of saving—additional protection for profits.

TIMKEN Rock Bit economies include (1) faster drilling; (2) more footage per bit; (3) saving of drilling time in handling steel; (4) reduced steel investment. If you have not tried this modern tool it will pay you to do so now. Write for further information.

8 Budd-built Zephyrs are now rolling on TIMKEN Bearings.

Glide — as you ride a Timken-equipped Train

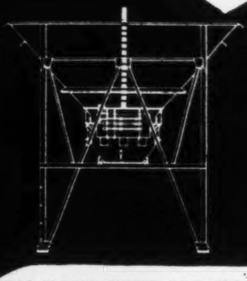
THE TIMKEN ROLLER BEARING
COMPANY, CANTON, OHIO

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

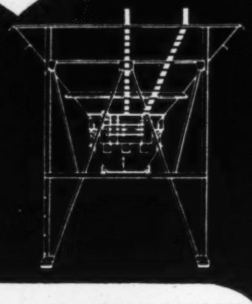
TIMKEN
ROCK BITS

ONLY IN BLAW-KNOX BATCHERPLANTS

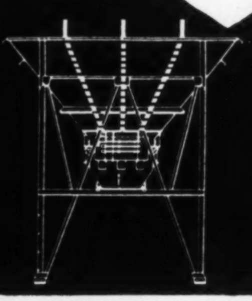
YOU BUY THIS 2 COMPARTMENT BIN



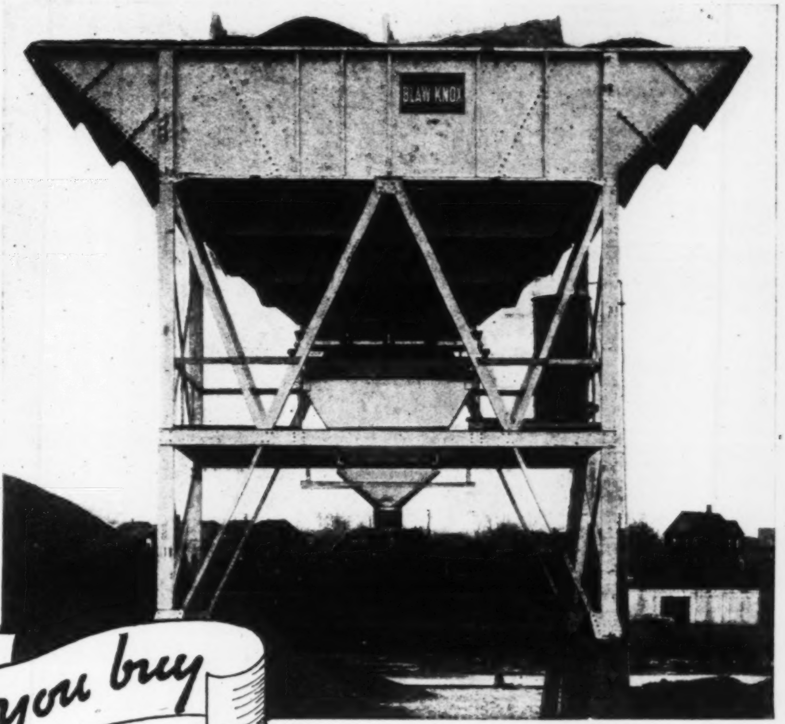
ON YOUR NEXT JOB YOU CAN CONVERT TO A 3 COMPARTMENT BIN LIKE THIS



. . . OR A 4 COMPARTMENT BIN LIKE THIS . . .



THE ORIGINAL BIN DESIGN PROVIDES FOR THESE CONVERSIONS TO BE MADE RAPIDLY AND ECONOMICALLY



you buy

VERSATILITY

Look ahead when you buy a bin and batcher, beyond your present job. Buy a *versatile* Blaw-Knox BATCHERPLANT—convertible to varying needs and specifications—to use on many jobs.

As your requirements change, add bin bulkheads at slight extra cost to suit your aggregate specifications.

The Weighing Batcher you buy originally is designed to accommodate extra weighing beams to meet these changing conditions, the cost of extra weighing beams is nominal.

Only at Blaw-Knox can you buy this changeability in a standard, shipped from stock, Batcherplant—with the added features of self-cleaning bin design; ease of erection; accurate, simple and dependable weighing batchers—and rugged construction to last through a number of jobs.

We will gladly send you complete details.

BLAW-KNOX COMPANY
2001 FARMERS BANK BUILDING PITTSBURGH, PENNA.
Offices and Representatives In Principal Cities

BLAW-KNOX

(*Contract Unit Prices continued from page 730*)

4. Steel support	40 ton	140.00	150.00
5. Timbers, permanent	65 M.b.m.	65.00	75.00
6. Backfill	114,000 c. y.	.30	.42
7. Rock fill	500 c. y.	3.00	3.70
8. Concrete structures	900 c. y.	20.00	19.00
9. Concrete anchors	1,600 c. y.	12.50	7.00
10. Cradle concrete	8,000 c. y.	5.00	6.00
11. Tunnel, adit concrete	2,330 c. y.	8.00	10.00
12. Precast conc. pipe, 54 in	25,730 l. f.	5.60	4.90
13. Centrif. cast conc. pipe, 42 in	1,980 l. f.	5.00	5.45
14. Stl. cyl. 14 ga., 54 in. conc	3,500 l. f.	4.45	3.70
15. Stl. cyl. 13 ga., 54 in. conc	1,800 l. f.	4.70	4.00
16. Stl. cyc. 12 ga., 54 in. conc	3,215 l. f.	4.91	4.30
17. Stl. cyl. 11 ga., 54 in. conc	3,385 l. f.	5.11	5.00
18. Stl. cyl. 10 ga., 54 in. conc	4,845 l. f.	5.30	5.00
19. Stl. cyl. 9 ga., 54 in. conc	1,815 l. f.	5.62	5.30
20. Stl. cyl. 8 ga., 54 in. conc	1,790 l. f.	5.81	5.60
21. Stl. cyl. 3/16 in., 54 in. conc	2,895 l. f.	6.13	6.30
22. Stl. cyl. 13/64 in., 54 in. conc	810 l. f.	6.41	7.00
23. Stl. cyl. 1/4 in., 54 in. conc	500 l. f.	7.11	10.00
24. Stl. cyl. 9/32 in., 54 in. conc	50 l. f.	8.09	11.00
25. Reinforcing steel	1,900,000 lb.	.046	.0425
26. Structural steel	180,000 lb.	.02	.02
27. Unlined stl. pipe, 57 in., 3/8 in	75 l. f.	20.00	16.00
28. Unlined stl. pipe, 57 in., 7/16 in	55 l. f.	22.00	17.00
29. Unlined stl. pipe, 57 in., 1/4 in	2,480 l. f.	14.47	14.00
30. Incasem. under trench	130 l. f.	23.00	38.00
31. Pipe coating, A	100 s. f.	.20	.30
32. Gunite lining	46,000 s. f.	.23	.15
33. Stl. M.H. timber and cover	45,000 lb.	.20	.20
34. Stl. M.H. timber, cover for connect.	15,000 lb.	.20	.20
35. Stl. manifolds	15,000 lb.	.22	.20
36. Stl. pipe, 30 in	225 l. f.	8.00	10.00
37. Electric test point	1 ea.	300.00	120.00
38. Electric test point, type 2	1 ea.	300.00	110.00
39. Valves, shutoff, reg., relief	60,000 lb.	.05	.04
40. Misc. metal	100,000 lb.	.06	.04
41. Drill grout holes	500 l. f.	2.00	1.00
42. Connections	150 ea.	3.00	2.00
43. Grout	200 c. y.	20.00	25.00
44. Concrete pipe, 8 in	100 l. f.	.60	.75
45. Concrete pipe, 12 in	600 l. f.	.60	1.00
46. Remodel H. C. sewer	5 ea.	50.00	60.00
47. Haul steel	200 Ton mi.	1.50	.50
48. Haul cement	3,000 Ton mi.	.25	.10

II — SCHED. 22P — 50-IN. PRECAST CONCRETE PIPE

1. D. W. Thurston Co., Los Angeles, Calif.	$683,662
2. American Conc. & Steel Pipe Co., Los Angeles, Calif.	700,497
3. United Concrete Pipe Corp., Los Angeles, Calif.	737,690

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excavation	145,000 c. y.	$1.15	$1.00	$0.80
2. Structure excav	1,000 c. y.	1.15	2.50	1.50
3. Backfill	113,000 c. y.	.21	.42	.35
4. Rock refill	500 c. y.	2.20	3.70	3.50
5. Structure concrete	600 c. y.	26.00	19.00	21.00
6. Conc. anchors, M.H. bases, etc	4,800 c. y.	7.50	7.00	7.00
7. Cradle concrete	6,400 c. y.	5.80	6.00	5.50
8. Lock joint prec. conc. pipe, 50 in	24,740 l. f.	3.60	4.70	7.39
9. Centrif. cast conc. pipe, 42 in	350 l. f.	4.90	4.95	7.00
10. Stl. cyl. reinf. conc. pipe, 50 in., 14 ga	1,270 l. f.	3.75	4.50	4.30
11. Stl. cyl. reinf. conc. pipe, 50 in., 13 ga	490 l. f.	4.20	3.80	4.55
12. Stl. cyl. reinf. conc. pipe, 50 in., 12 ga	805 l. f.	4.70	4.10	4.76
13. Stl. cyl. reinf. conc. pipe, 50 in., 11 ga	490 l. f.	5.15	4.30	4.96
14. Stl. cyl. reinf. conc. pipe, 50 in., 10 ga	1,025 l. f.	5.50	4.60	5.15
15. Stl. cyl. reinf. conc. pipe, 50 in., 9 ga	5,505 l. f.	6.05	5.00	5.47
16. Stl. cyl. reinf. conc. pipe, 50 in., 8 ga	5,630 l. f.	6.60	5.20	5.66
17. Stl. cyl. reinf. conc. pipe, 3/16 x 50 in	7,615 l. f.	6.85	6.00	6.08
18. Stl. cyl. reinf. conc. pipe, 13/64 x 50 in	900 l. f.	7.35	6.30	6.26
19. Stl. cyl. reinf. conc. pipe, 1/4 x 50 in	390 l. f.	11.00	8.90	6.96
20. Stl. cyl. reinf. conc. pipe, 9/32 x 50 in	1,255 l. f.	11.95	10.00	7.94
21. Stl. cyl. reinf. conc. pipe, 5/16 x 50 in	615 l. f.	13.10	12.00	8.75
22. Stl. cyl. reinf. conc. pipe, 11/32 x 50 in	10 l. f.	15.00	15.00	9.50
23. Stl. cyl. reinf. conc. pipe, 3/8 x 50 in	15 l. f.	15.50	16.00	12.50
24. Reinf. steel, prec. conc. pipe	1,900,000 lb.	.0425	.0425	.046
25. Structure reinf. steel	260,000 lb.	.009	.02	.02
26. Unlined stl. pipe, 3/8 x 53 in.	510 l. f.	15.00	16.00	11.00
27. Unlined stl. pipe, 13/32 x 53 in.	50 l. f.	15.30	16.30	14.00
28. Unlined stl. pipe, 7/16 x 53 in.	265 l. f.	16.50	17.00	16.00
29. Unlined stl. pipe, 15/32 x 53 in.	240 l. f.	18.25	19.00	19.00
30. Incasem. under R.R. tracks	380 l. f.	68.00	38.00	27.00
31. Pipe coating, B	9,700 s. f.	.115	.25	.18
32. Gunite lining, stl. cyl	47,000 s. f.	.17	.15	.20
33. Stl. manhole thimbles, covers	47,000 lb.	.16	.15	.20
34. Stl. thimbles for conn.	14,000 lb.	.21	.20	.20
35. Stl. manifold red. sec., etc.	35,000 lb.	.17	.20	.22
36. Electrolysis points, type 1.	3 ea.	115.00	120.00	300.00
37. Electrolysis points, type 2.	2 ea.	115.00	110.00	300.00
38. Valves, shutoff, reg., relief.	50,000 lb.	.045	.04	.05
39. Misc. metal	100,000 lb.	.06	.04	.06
40. Concrete pipe, 8 in	500 l. f.	.30	.75	.60
41. Concrete pipe, 12 in	100 l. f.	.35	1.00	.60
42. Connections, remodel, house	6 ea.	12.00	60.00	50.00
43. Haul steel	300 Ton mi.	.14	.50	1.00
44. Haul cement	3,000 Ton mi.	.14	.10	.25

III — SCHED. 23P — 50-IN. CONCRETE PIPE

1. American Conc. & Steel Pipe Co., Los Angeles, Calif.	$922,769
2. United Concrete Pipe Corp., Los Angeles, Calif.	938,680

Item	Quan.	Unit Prices (1)	(2)
1. Trench excav	147,000 c. y.	$1.50	$2.00
2. Structure excav	100 c. y.	4.00	2.50
3. Backfill	109,000 c. y.	.42	.30
4. Rock refill	1,000 c. y.	3.70	3.50
5. Structure concrete	250 c. y.	19.00	22.00
6. Concrete anchors, M. H., etc	5,000 c. y.	7.00	7.00
7. Cradle concrete	7,600 c. y.	6.00	5.50
8. Lock joint pipe 50 in	30,680 l. f.	4.55	7.35
9. Stl. conc. pipe, 50 x 3/16 in	2,000 l. f.	6.50	6.08
10. Stl. conc. pipe, 50 x 13/64 in	18,205 l. f.	6.30	6.26
11. Stl. conc. pipe, 50 x 7/32 in	7,815 l. f.	6.60	6.56
12. Stl. conc. pipe, 50 x 15/64 in	1,165 l. f.	7.00	6.85
13. Stl. conc. pipe, 50 x 9/32 in	270 l. f.	8.00	7.44
14. Stl. conc. pipe, 50 x 5/16 in	320 l. f.	10.20	7.75
15. Stl. conc. pipe, 50 x 11/32 in	745 l. f.	11.00	8.50
16. Stl. conc. pipe, 50 x 3/8 in	455 l. f.	11.80	9.50
17. Stl. conc. pipe, 50 x 13/32 in	765 l. f.	12.70	10.20
18. Reinf. stl. prec. conc. pipe	2,750,000 lb.	.0425	.045
19. Structure reinf. steel	210,000 lb.	.02	.02
20. Unlined stl. pipe, 53 x 3/8 in	375 l. f.	16.00	11.50
21. Unlined stl. pipe, 53 x 13/32 in	585 l. f.	16.30	11.50
22. Unlined stl. pipe, 53 x 7/16 in	250 l. f.	17.00	14.50
23. Incasem. under R. R. tracks	1,210 l. f.	38.00	25.00
24. Pipe coating, A	100 s. f.	.30	.20
25. Gunite stl. cyl. lining	50,000 s. f.	.15	.20
26. Stl. M.H. thimbles, covers	58,000 lb.	.15	.20
27. Stl. thimble conn	12,000 lb.	.20	.20
28. Stl. manifold, etc	7,000 lb.	.20	.30
29. Electrolysis, type 1	3 ea.	120.00	300.00
30. Electrolysis, type 2	3 ea.	110.00	300.00
31. Valves, shutoff, reg., etc	15,000 lb.	.04	.07
32. Misc. metal	60,000 lb.	.04	.05
33. Concrete pipe, 8 in	100 l. f.	.75	.70
34. Concrete pipe, 12 in	100 l. f.	1.00	.70
35. Remodel H. C. sewer	3 ea.	60.00	50.00
36. Haul steel	200 Ton mi.	.50	1.50
37. Haul cement	3,000 Ton mi.	.10	.25

IV — SCHED. 21S — 55-IN. UNLINED PIPE, GUNITE EXTERIOR

1. R. G. Clifford, San Francisco, Calif.	$728,018
2. J. F. Shea Co., Inc., Los Angeles, Calif.	765,070
3. D. W. Thurston, Los Angeles, Calif.	800,474

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav	124,000 c. y.	$1.15	$1.11	$1.10
2. Structure excav	900 c. y.	2.00	1.75	1.25
3. Tunnel, adit excav	4,000 c. y.	15.00	10.00	12.00
4. Stl. support, tunnel	40 ton	150.00	140.00	150.00
5. Timbers, permanent, tunnel	65 M.b.m	60.00	35.00	100.00
6. Backfill	105,000 c. y.	.14	.23	.21
7. Rock refill	500 c. y.	3.60	4.00	2.15
8. Structure concrete	700 c. y.	26.00	20.00	26.00
9. Concrete anchors, M.H., etc	550 c. y.	21.00	16.00	7.55
10. Cradle concrete	320 c. y.	18.00	7.00	5.75
11. Tunnel concrete	2,210 c. y.	11.00	13.00	10.00
12. Centrif. cast conc. pipe, 42 in	1,980 l. f.	6.10	9.00	4.90
13. Reinf. stl. prec. conc. pipe.	110,000 lb.	.06	.05	.06
14. Reinf. steel, structures	110,000 lb.	.02	.012	.009
15. Unlined stl. pipe, 3/8 x 55 in.	20,565 l. f.	11.84	13.50	15.55
16. Unlined stl. pipe, 13/32 x 55 in.	4,035 l. f.	12.62	14.50	16.45
17. Unlined stl. pipe, 7/16 x 55 in.	775 l. f.	13.28	15.50	17.95
18. Unlined stl. pipe, 15/32 x 55 in.	1,055 l. f.	14.00	16.50	19.00
19. Unlined stl. pipe, 1/4 x 55 in.	2,480 l. f.	9.70	12.50	11.75
20. Incasem. under R.R. tracks	130 l. f.	60.00	80.00	70.00
21. Pipe coating, A	263,000 s. f.	.068	.09	.07
22. Pipe coating, B	119,000 s. f.	.108	.13	.115
23. Stl. manhole thimbles, covers	41,000 lb.	.24	.17	.16
24. Stl. thimbles, connections.	12,000 lb.	.50	.16	.21
25. Stl. manifolds, sec. etc	20,000 lb.	.23	.25	.17
26. Stl. pipe, 30 in., Ascot reserv	225 l. f.	7.00	9.00	8.15
27. Electrolysis test point, type 1	1 ea.	150.00	120.00	115.00
28. Electrolysis test point, type 2	1 ea.	150.00	100.00	115.00
29. Valves, shutoff, reg., relief.	40,000 lb.	.05	.06	.045
30. Misc. metal	105,000 lb.	.05	.03	.06

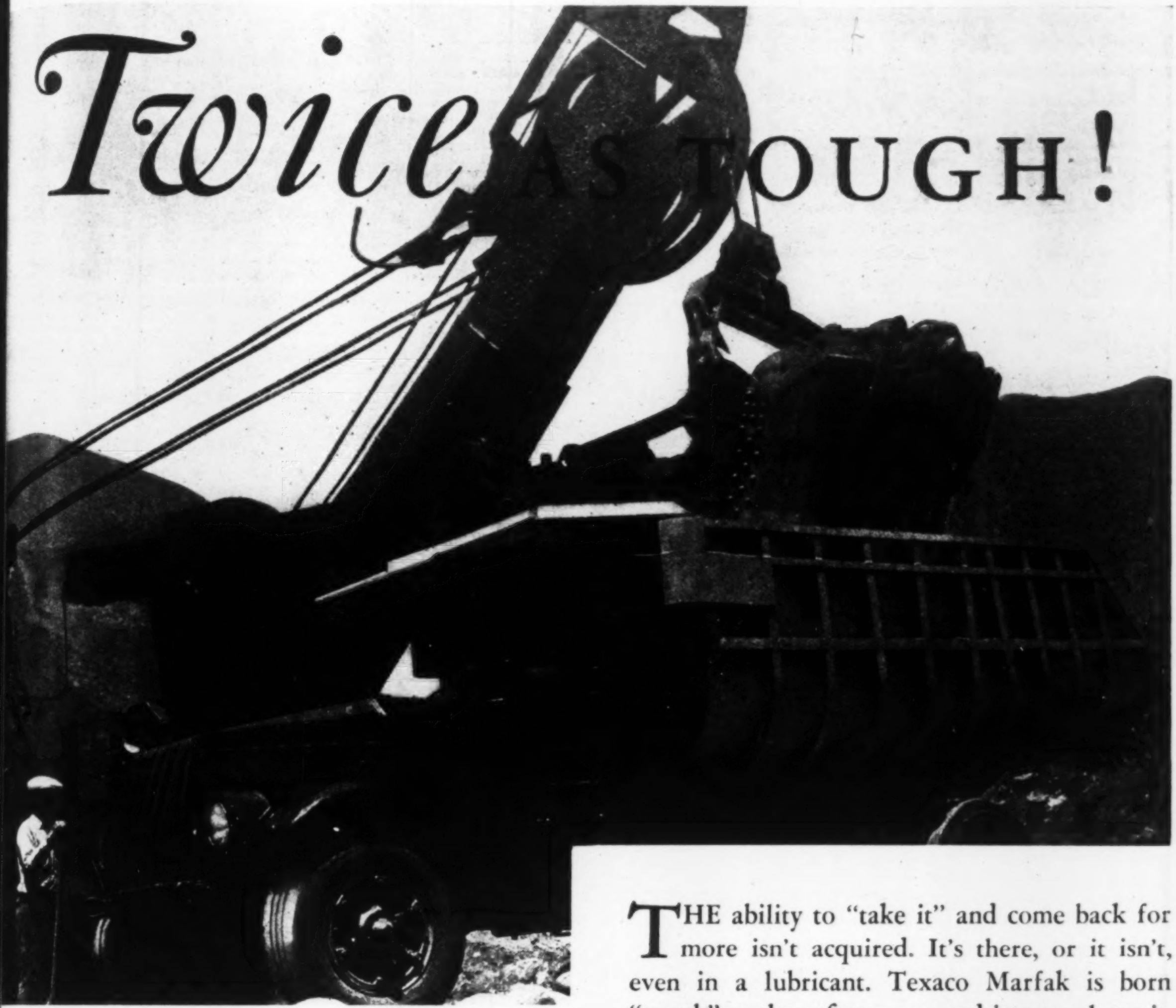
V — SCHED. 22S — 51-IN. STEEL PIPE, GUNITE EXTERIOR

1. J. F. Shea Co., Inc., Los Angeles, Calif.	$683,910
2. R. G. Clifford, San Francisco, Calif.	686,478
3. D. W. Thurston, Los Angeles, Calif.	707,350

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav	124,000 c. y.	$1.41	$1.85	$1.15
3. Backfill	108,000 c. y.	.23	.20	.21
6. Concrete anchors, M.H., etc.	600 c. y.	16.00	21.00	7.50
7. Concrete cradle	60 c. y.	8.00	18.00	5.80
8. Centrif. cast conc. pipe, 42 in	350 l. f.	9.00	6.10	4.90
9. Reinf. stl. prec. conc. pipe.	12,000 lb.	.05	.06	.06
10. Structure reinf. steel	100,000 lb.	.012	.02	.009
11. Unlined steel pipe, 51 x 3/8 in	27,760 l. f.	12.50	11.30	14.90
12. Unlined stl. pipe, 51 x 13/32 in	80 l. f.	13.50	11.94	14.20

(*Continued on second following page*)

Twice AS TOUGH!



TEXACO MARFAK stays put. Its clinging ability assures long life no matter where it is used. In wheel bearings, some big bus fleet operators run 50,000 miles without even taking off hub caps for inspection. Marfak is the ideal lubricant for shackles, grease-type universal joints and all chassis parts.

NEW TEXACO MOTOR OIL is as distinctive as Marfak. It keeps engines CLEAN, so that rings and valves continue to operate in a way that makes for full power. This new oil is purified by the Furfural Process which takes out tar, gum and other sludge-forming elements . . . Furfural is made from corn, oats, rye, etc.

THE ability to "take it" and come back for more isn't acquired. It's there, or it isn't, even in a lubricant. Texaco Marfak is born "tough" at the refinery . . . and it never loses it. That's why it makes parts last twice as long.

Marfak coats chassis lubrication points with a film that is at least twice as long-lasting. Made from heavy-bodied mineral oil, Marfak is both adhesive and cohesive. It cushions bearings against shock . . . seals bearings against dirt and road water.

Trained automotive engineers are available for consultation on the selection and application of Texaco Automotive Lubricants. Prompt deliveries assured through 2070 warehouse plants throughout the United States.

Start using Texaco Marfak . . . twice as tough, it lasts twice as long.

The Texas Company, 135 E. 42nd St., N. Y. C.

TEXACO T REG. T. M.

TEXACO *MARFAK*

(Contract Unit Prices continued from page 28)

13. Unlined steel pipe, 51 x $\frac{7}{16}$ in	285 l. f.	14.00	12.60	16.40
14. Unlined steel pipe, 51 x $\frac{15}{32}$ in	165 l. f.	15.00	13.28	18.00
15. Incasem. under R.R. tracks	395 l. f.	65.00	60.00	68.00
16. Pipe coating, A	23,000 s. f.	.09	.068	.07
17. Pipe coating, B	353,000 s. f.	.13	.108	.115
18. Stl. M.H. thimbles, covers.	42,000 lb.	.17	.25	.16
27. Haul steel	200 Ton mi.	.50	.20	.14
28. Haul cement	300 Ton mi.	.50	.20	.14

VI — SCHED. 23S — UNLINED 51-IN. STEEL PIPE, GUNITE EXTERIOR

1.	J. F. Shea Co., Inc., Los Angeles, Calif	$843,484
2.	R. G. Clifford, San Francisco, Calif	874,295
3.	Emsco Derrick & Equipt Co., Los Angeles, Calif	887,235

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav	124,000 c. y.	$1.79	$2.30	$1.42
3. Backfill	105,000 c. y.	.23	.22	4.75
6. Concrete anchors, M. H. bases	900 c. y.	16.00	21.00	9.60
7. Struc. steel reinf	50,000 lb.	.012	.02	.025
8. Unlined stl. pipe, 51 x ⅜ in.	12,930 l. f.	12.50	11.20	15.03
9. Unlined stl. pipe, 51 x $\frac{13}{32}$ in.	20,655 l. f.	13.35	11.80	15.97
10. Unlined stl. pipe, 51 x $\frac{7}{16}$ in.	865 l. f.	14.00	12.50	16.46
11. Incasement under R. R. tracks	1,315 l. f.	50.00	60.00	35.00
12. Pipe coating, A	407,000 s. f.	.09	.068	.075
13. Pipe coating, B	39,000 s. f.	.13	.108	.09
14. Stl. M.H. thimbles, covers	52,000 lb.	.17	.25	.245
24. Haul steel	100 Ton mi.	.50	.20	.20
25. Haul cement	400 Ton mi.	.50	.20	.15

VII — SCHED. 21SC — MORTAR LINED 55-IN. STEEL PIPE, GUNITE EXTERIOR

1.	R. G. Clifford, San Francisco, Calif	$756,796
2.	United Conc. Pipe Corp., Los Angeles, Calif	765,622
3.	J. F. Shea Co., Inc., Los Angeles, Calif	815,897

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav.	124,000 c. y.	$1.15	$0.81	$1.12
2. Structure excav.	900 c. y.	2.00	1.10	1.75
3. Excavation, tunnel, adit	4,000 c. y.	15.00	8.11	10.00
6. Backfill	105,000 c. y.	.14	.34	.23
8. Structure concrete	700 c. y.	26.00	20.85	20.00
9. Concrete anchors, etc.	550 c. y.	21.00	14.00	16.00
10. Cradle concrete	320 c. y.	18.00	7.00	7.00
11. Concrete, tunnel	2,210 c. y.	11.00	8.00	13.00
12. Centrif. cast conc. pipe, 42 in.	1,980 l. f.	6.10	5.00	9.00
13. Reinf. stl. prec. conc. pipe	110,000 lb.	.06	.06	.05
14. Structure reinf.	110,000 lb.	.02	.02	.012
15. Spun mortar, pipe, 65x⅜ in.	20,565 l. f.	12.88	15.53	15.20
16. Spun mortar, pipe, 65x$\frac{13}{32}$ in.	4,035 l. f.	13.65	16.63	16.20
17. Spun mortar, pipe, 65x$\frac{7}{16}$ in.	775 l. f.	14.30	17.23	18.00
18. Spun mortar, pipe, 65x$\frac{15}{32}$ in.	1,055 l. f.	15.00	17.68	18.50
19. Spun mortar, pipe, 65x¼ in.	2,480 l. f.	10.50	14.47	14.00
21. Pipe coating, A	263,000 s. f.	.068	.07	.09
22. Pipe coating, B	119,000 s. f.	.108	.125	.13
23. Stl. M.H. thimbles, covers.	41,000 lb.	.25	.20	.17
24. Thimbles, conn. flgd. ftgs.	12,000 lb.	.50	.20	.16
25. Stl. manifolds, sect., etc.	20,000 lb.	.23	.22	.25
29. Valves, shutoff, reg., relief.	40,000 lb.	.05	.05	.06
30. Miscellaneous metal	105,000 lb.	.05	.06	.03
38. Haul cement	1,000 ton mi.	.20	.40	.40

VIII — SCHED. 22SC — MORTAR LINED 51-IN. STEEL PIPE, GUNITE EXT.

1.	Morrison-Knudsen Co., Los Angeles, Calif	$684,157
2.	J. F. Shea Co., Inc., Los Angeles, Calif	733,883
3.	United Concrete Pipe Corp., Los Angeles, Calif	736,440

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav.	124,000 c. y.	$1.18	$1.40	$0.98
3. Backfill	108,000 c. y.	.26	.23	.38
6. Cradle concrete	60 c. y.	8.00	8.00	8.00
7. Centrif. cast conc. pipe, 42 in.	350 l. f.	11.00	9.00	7.00
8. Reinf. stl. prec. conc. pipe	12,000 lb.	.06	.05	.06
9. Structure reinf. steel	100,000 lb.	.02	.012	.02
10. Spun mortar, stl. pipe, 51x⅜ in.	27,760 l. f.	13.25	14.30	15.87
11. Spun mortar, stl. pipe, 51x$\frac{13}{32}$ in.	80 l. f.	14.50	15.00	16.97
12. Spun mortar, stl. pipe, 51x$\frac{7}{16}$ in.	285 l. f.	15.50	16.50	17.57
13. Spun mortar, stl. pipe, 51x$\frac{15}{32}$ in.	165 l. f.	16.00	17.50	18.54
14. Incasem. under R.R. track	395 l. f.	40.00	65.00	27.00
15. Pipe coating, A	23,000 s. f.	.075	.09	.17
16. Pipe coating, B	353,000 s. f.	.14	.13	.14
17. Stl. M.H. thimbles, covers.	42,000 lb.	.25	.17	.20
27. Haul steel	200 ton mi.	.30	.50	1.50
28. Haul cement	300 ton mi.	.20	.50	.50
29. Concrete anchors, M.H. bases, sup.	600 c. y.	14.00	16.00	14.00

IX — SCHED. 23SC — MORTAR LINED 51-IN. STEEL PIPE. GUNITE EXT.

1.	Morrison-Knudsen Co., Los Angeles, Calif	$872,500
2.	United Concrete Pipe Corp., Los Angeles, Calif	881,772
3.	J. F. Shea Co., Inc., Los Angeles, Calif	893,641

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav.	124,000 c. y.	$2.00	$1.40	$1.30
3. Backfill	105,000 c. y.	.26	.30	.23
6. Concrete anchors, M.H. bases	900 c. y.	14.00	14.00	16.00
7. Stl. structures	50,000 lb.	.02	.025	.012
8. Spun mortar lined stl. pipe, 51x⅜ in.	12,930 l. f.	13.00	16.13	13.90
9. Spun mortar lined stl. pipe, 51x$\frac{13}{32}$ in.	20,655 l. f.	13.50	16.20	14.80
10. Spun mortar lined stl. pipe, 51x$\frac{7}{16}$ in.	865 l. f.	15.20	17.33	15.00
11. Incasem. under R.R. track	1,315 l. f.	40.00	30.00	50.00
12. Pipe coating, A	407,000 s. f.	.075	.07	.09
13. Pipe coating, B	39,000 s. f.	.14	.14	.13
14. Stl. M.H. thimbles, covers.	52,000 lb.	.25	.20	.17
24. Haul steel	100 ton mi.	.30	1.50	.50
25. Haul cement	400 ton mi.	.20	.50	.50

X — SCHED. 21SE — ENAMEL LINED 57-IN. STEEL PIPE. GUNITE LINED

1.	United Concrete Pipe Corp., Los Angeles, Calif	$757,312
2.	R. G. Clifford, San Francisco, Calif	762,325
3.	J. F. Shea Co., Inc., Los Angeles, Calif	798,300

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav.	129,000 c. y.	$0.81	$1.15	$1.13
2. Structure excav.	900 c. y.	1.10	2.00	1.75
6. Backfill	109,000 c. y.	.27	.14	.23
8. Structure concrete	700 c. y.	21.00	26.00	20.00
9. Concrete anchors, etc.	550 c. y.	12.00	21.00	16.00
10. Cradle concrete	320 c. y.	8.00	18.00	7.00
12. Centrif. cast conc. pipe, 42 in.	1,980 l. f.	5.00	6.10	9.00
13. Reinf. stl. prec. conc. pipe.	110,000 lb.	.06	.06	.05
14. Reinf. stl., structures	110,000 lb.	.02	.02	.012
15. Enamel lined stl. pipe, 57x⅜ in.	19,905 l. f.	15.00	12.52	14.00
16. Enamel lined stl. pipe, 57x$\frac{13}{32}$ in.	3,115 l. f.	15.95	13.30	15.00
17. Enamel lined stl. pipe, 57x$\frac{7}{16}$ in.	2,490 l. f.	16.80	14.00	16.00
18. Enamel lined stl. pipe, 57x$\frac{15}{32}$ in.	960 l. f.	17.60	14.73	17.00
19. Enamel lined stl. pipe, 57x½ in.	360 l. f.	18.20	15.42	18.00
20. Enamel lined stl. pipe, 57x¼ in.	2,480 l. f.	12.97	10.23	13.00
22. Pipe coating, A	273,000 s. f.	.08	.068	.09
23. Pipe coating, B	126,000 s. f.	.14	.108	.13
24. Stl. M.H. thimbles, covers.	41,000 lb.	.20	.24	.17
25. Stl. thimble conn. flang. ftgs.	12,000 lb.	.25	.50	.16
26. Stl. manifolds, sec., etc.	20,000 lb.	.22	.23	.25
30. Valves, shutoff, reg., relief.	40,000 lb.	.05	.05	.06
31. Misc. metal	105,000 lb.	.06	.05	.03
39. Haul cement	1,200 ton mi.	.40	.20	.40

XI — SCHED. 22SE — ENAMEL LINED 53-IN. STEEL PIPE, GUNITE EXT.

1.	Morrison-Knudsen Co., Los Angeles, Calif	$764,674
2.	J. F. Shea Co., Inc., Los Angeles, Calif	711,632
3.	D. W. Thurston, Los Angeles, Calif	734,851

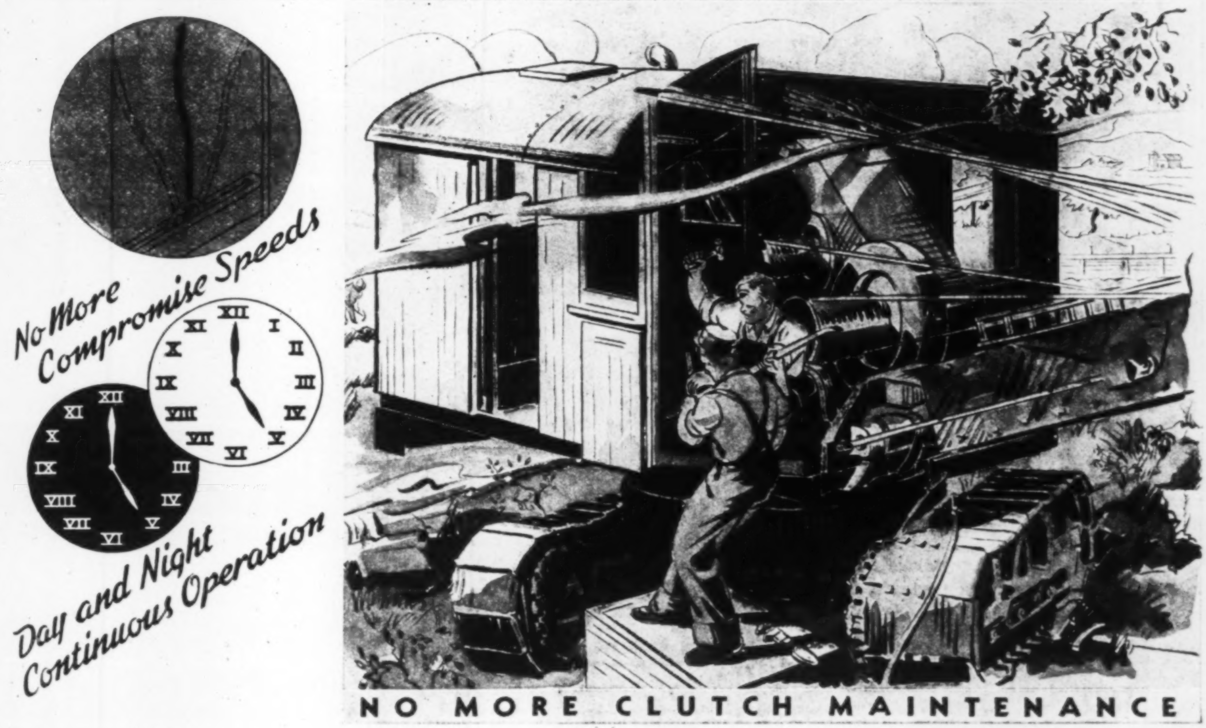
Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav.	129,000 c. y.	$1.15	$1.38	$1.15
3. Backfill	112 c. y.	.26	.23	.21
6. Concrete anchors, M.H, etc	600 c. y.	14.00	16.00	7.50
7. Cradle concrete	60 c. y.	8.00	8.00	5.80
8. Centrif. cast conc. pipe, 42 in.	350 l. f.	11.00	9.00	4.90
9. Reinf. stl prec conc. pipe	12,000 lb.	.06	.05	.06
10. Structure reinf steel	100,000 lb.	.02	.012	.009
11. Enamel lined stl pipe, 53x⅜ in.	27,210 l. f.	12.75	13.25	15.55
12. Enamel lined pipe, 53x$\frac{13}{32}$ in.	580 l. f.	13.25	14.00	16.40
13. Enamel lined pipe, 53x$\frac{7}{16}$ in.	265 l. f.	14.00	15.00	17.20
14. Enamel lined pipe, 53x$\frac{15}{32}$ in.	235 l. f.	14.75	16.00	18.60
15. Incasem. under R.R. tracks	395 l. f.	40.00	65.00	68.00
16. Pipe coating, A	24,000 s. f.	.075	.09	.07
17. Pipe coating, B	366,000 s. f.	.14	.13	.115
18. Stl. M.H. thimbles, covers.	42,000 lb.	.25	.17	.16
28. Haul steel	200 ton mi.	.30	.50	.14
29. Haul cement	300 ton mi.	.20	.50	.14

XII — SCHED. 23SE — ENAMEL LINED 53-IN. STEEL PIPE, GUNITE EXT.

1.	Morrison-Knudsen Co., Los Angeles, Calif	$887,133
2.	J. F. Shea Co., Inc., Los Angeles, Calif	888,019
3.	United Concrete Pipe Corp., Los Angeles, Calif	893,169

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Trench excav.	130,000 c. y.	$1.95	$1.77	$1.40
6. Concrete anchors, M.H. bases	900 c. y.	14.00	16.00	14.00
7. Rfg. steel, structures	50,000 lb.	.02	.012	.025
8. Enamel lined, stl. pipe, 53x⅜ in.	5,585 l. f.	12.25	13.30	15.95
9. Enamel lined stl. pipe, 53x$\frac{13}{32}$ in.	22,785 l. f.	13.65	14.00	16.00
10. Enamel lined stl. pipe, 53x$\frac{7}{16}$ in.	6,080 l. f.	14.70	14.80	17.25
11. Incasem. under R.R. tracks	1,315 l. f.	40.00	50.00	30.00
12. Pipe coating, A	423,000 s. f.	.07	.09	.07
13. Pipe coating, B	41,000 s. f.	.14	.13	.14
14. Stl. M.H. thimbles, covers.	52,000 lb.	.25	.17	.20
24. Haul steel	100 ton mi.	.30	.50	1.50
25. Haul cement	400 ton mi.	.20	.50	.50

For Small Shovels, Too, Electric Drive Costs Less for Upkeep


No More Compromise Speeds
Day and Night Continuous Operation

NO MORE CLUTCH MAINTENANCE

DEPENDABLE as the power that lights your home, electricity as the drive for your small power shovels will enable you to excavate more tonnage and to excavate it more rapidly than a friction-driven shovel. Electrical acceleration is faster and smoother, and there is less time out for clutch maintenance and other repairs.

The greater availability and speed of electric shovels has been demonstrated repeatedly on the big power shovels.* Why not apply the same advantages to the jobs where you use small ones?

By means of either variable-voltage or rheostatic control, changes in speed are made instantly and with but infinitesimal mechanical wear. Furthermore, with electric drive, the diesel engine or gasoline engine driving the generator operates continuously at its most efficient speed. Thus you get the maximum efficiency of the engine continuously. General Electric, Schenectady, N. Y.

*One contractor wrote that he took his G-E equipped shovel out of service temporarily, not because it was necessary to do so, but because he felt that any equipment that had been in operation for five years without interruption should have a rest.

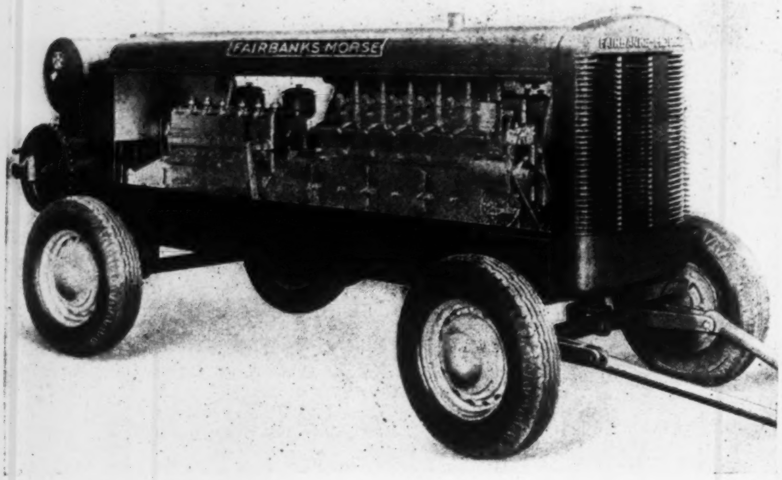
YOU GET SPEED FOR THE JOB, MORE SERVICE FOR YOUR MONEY, WHEN YOU SPECIFY G-E EQUIPMENT

011-236H

GENERAL ELECTRIC

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Diesel Compressor

Light weight, efficiency and reliability are claimed for the new diesel-powered 210-c.f.m. air compressor announced by Fairbanks-Morse & Co., Chicago. The new compressor is available with several types of portable and semi-portable mountings.

The compressor is designed to operate at full engine speed, permitting direct connection to the engine without reduction gears or belts.

Mounted on rubber wheels, the compressor has a shipping weight of six thousand five hundred and thirty lb.

• • •

New Nickel Uses

In connection with the National Metals Congress which opened in Atlantic City Oct. 8, the International Nickel Co. has canvassed the new uses of nickel in American industry, a number of which are of interest to those in the civil engineering and construction field.

The high strength structural nickel-copper steels, the company finds, are being used in hopper car bodies, where their resistance to atmospheric corrosion is of advantage. The ready fabrication and easy welding of the nickel copper steels, in combination with strength and corrosion resistance, have also led to their adoption in the clamshell buckets of dredges and conveyors.

High strength structural steels are also being widely used in heavy engineering structures. An outstanding example is the San Francisco-Oakland Bay bridge, which contains 3,680 tons of 3½ per cent nickel steel in the form of anchor plates and structural shapes.

As a means of reducing weight, these high strength steels have been used in hand tools. Box wrenches of nickel-molybdenum steel have recently been placed on the market. Their chief advantage is the reduced clearance at the jaws permitting the use of the wrenches on bolts in otherwise inaccessible locations. An interesting development in pneumatic chisel steels for ripping up street pavements has been the use of a tool steel bit welded to a carburized 5 per cent nickel steel shank in order to avoid excessive failures arising from fatigue.

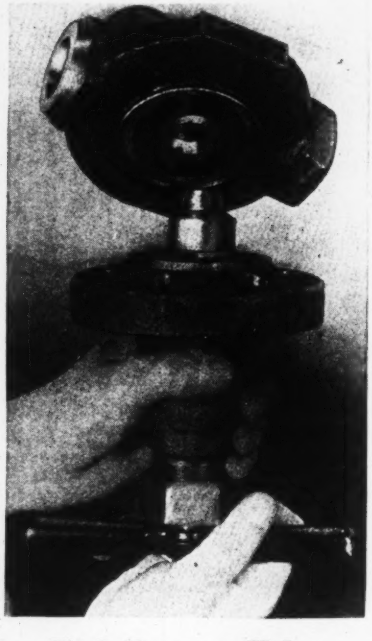
Nickel-molybdenum cast iron, with tensile strength in excess of 50,000 pounds per square inch, has been increasingly used lately for crankshafts on diesel engines of marine, tractor and small stationary types. Cast iron of the nickel-chromium type, which is valuable for its abrasion resistance in the cast condition, has found use in dredge pump casings and impellers. Butterfly valves on certain navigation locks on the Monongahela River have been made of Ni-Resist, an alloyed cast iron containing about 14 per cent nickel and 6 per cent copper. This metal was used because of the extreme corrosiveness of the river water to which it was exposed.

Pipe Threader

A semi-adjustable taper-post type of pipe threader using a separate set of dies for each size is being offered by Beaver Pipe Tools, Inc., Warren, Ohio, in the new Model 48-R which threads 2½, 3, 3½ and 4-in. pipe. An extra wide die with a wide throat centers and holds the tool on the pipe.

Gears are fully-enclosed, and the driving pinion is "straddle-mounted" with a bearing both above and below the gear teeth on the pinion. The dies are held in position by a spring-backed ball, and the proper position for setting dies to cut a standard thread is marked by a shoulder on the tapered post.

The 48-R will cut only right-hand tapered threads, American Briggs Standard.



High Pressure Valve

A new design of valve for high pressure and high temperature steam service has been developed by the Hancock Valve Division of Manning, Maxwell & Moore, Inc., Bridgeport, Conn. The new Hancock Duravalve incorporates internal Stellite seats which, the manufacturer says, put an end to valve maintenance due to steam leaking between the valve seat ring and the valve body. The new design of the valve permits the seat facing to be easily welded in and serviced even on small size valves.

The valves are made in one basic size and then tapped or bored for ½ in., ¾ in. or 1 in. pipe, thus reducing the number of repair parts and maintenance parts which must be kept in stock.

No wonder tires can't side-skid or cut!

no steel at right angles to traffic direction

it's IRVING DECKING
The open steel mesh bridge floor

Jam on your brakes—and your car slides straight ahead a few feet—then STOPS—on Irving Decking. This pavement never collects snow, ice, oil or grease. Large UNITS easily, quickly, cheaply assembled into 1-piece job WITHOUT A JOINT. Lightweight; strong; safe; self-cleaning; low in maintenance cost—the perfect bridge flooring.

Send for Catalog F.200.

IRVING IRON WORKS COMPANY
LONG ISLAND CITY, NEW YORK
Originators of
IRVING SUBWAY GRATING

NEW PUBLICATIONS

KORFUND products for "Eliminating Vibration Losses" are described in a 16-page booklet of that name—The Korfund Co., Inc., Long Island City.

A LOT OF PICTURES of pile driving jobs and a minimum of text are in a new folder "Union Pile Driving Hammers"—Union Iron Works, Inc., Elizabeth, N. J.

AN UNUSUALLY ATTRACTIVE booklet, typographically and photographically, is the new catalog of Page walking draglines—Page Engineering Co., Chicago, Ill.

A DESCRIPTION of the properties and a catalog of the various types of Cedar Rapids Symons screens are included in a folder, Bulletin SS-1—Iowa Mfg. Co., Cedar Rapids, Iowa.

AN INTRODUCTION to the new Binks catalog points out the problems arising from increased use of water for cooling purposes coupled with inadequate water supply and sewage lines and suggests the use of Binks equipment as an answer. The catalog describes Binks water cooling towers and spray ponds in pictures, diagrams and tables and also catalogs Binks industrial spray nozzles—Binks Mfg. Co., Chicago.

FEATURES, uses, and advantages of the new 40 volt simplified Hobart arc welder are describes in a new booklet "Arc Welding"—The Hobart Bros. Co., Troy, Ohio.

A NEW CHART shows the dimensions and weights of Motex bearing—bronze cored and solid bars—Consolidated Metals Corp., Detroit.

A LOOSE-LEAF BULLETIN, No. 35-76, describes ADSCO Types E and F water heaters—American District Steam Co., North Tonawanda, N. Y.

A BOOKLET, "Trenchlay and Ruralay," describes the uses and methods of application of these cables for underground installation of power lines in rural districts—General Cable Corp., New York City.

TIRES for industrial trucks and wheelbarrows and rubber tired casters are described in a new industrial tire handbook—The B. F. Goodrich Co., Akron, Ohio.

JOHNS-MANVILLE has issued its 1937-38 catalog of industrial products. In 64 pages, the booklet contains recommendations on building of insulating structures and information on insulation, roofing, corrugated Transite and Transite pipe, industrial friction materials, electrical conduit and packings and gaskets as well as a number of other products—Johns-Manville, New York City.

A CHART in handy size for filing gives detailed specifications for laminated brass shim stock—Laminated Shim Co., Inc., Long Island City, N. Y.

THE HISTORY, characteristics and uses of the Venturi meter are described in a new catalog of Venturi meter tubes and registers, Bulletin No. 293—Builders Iron Foundry, Providence, R. I.

EQUIPMENT for the proportioning and feeding of chlorine into water supply lines is interestingly described in a 12 page booklet, Bulletin No. "Red"—Proportioneers, Inc., Providence, R. I.

JOB PHOTOS show recent applications of DeLaval turbines in a new brochure, "Modern Turbines to Reduce Costs"—DeLaval Steam Turbine Co., Trenton, N. J.

USES of Manganal welding electrodes in a number of different industries are pointed out in a new 16 page catalog—Stulz-Sickles Co., Newark, N. J.

RECOMMENDATIONS for the safe use of the oxy-acetylene torch are contained in a booklet "Preventing Welding and Cutting Fires"—The Linde Air Products Co., New York City.

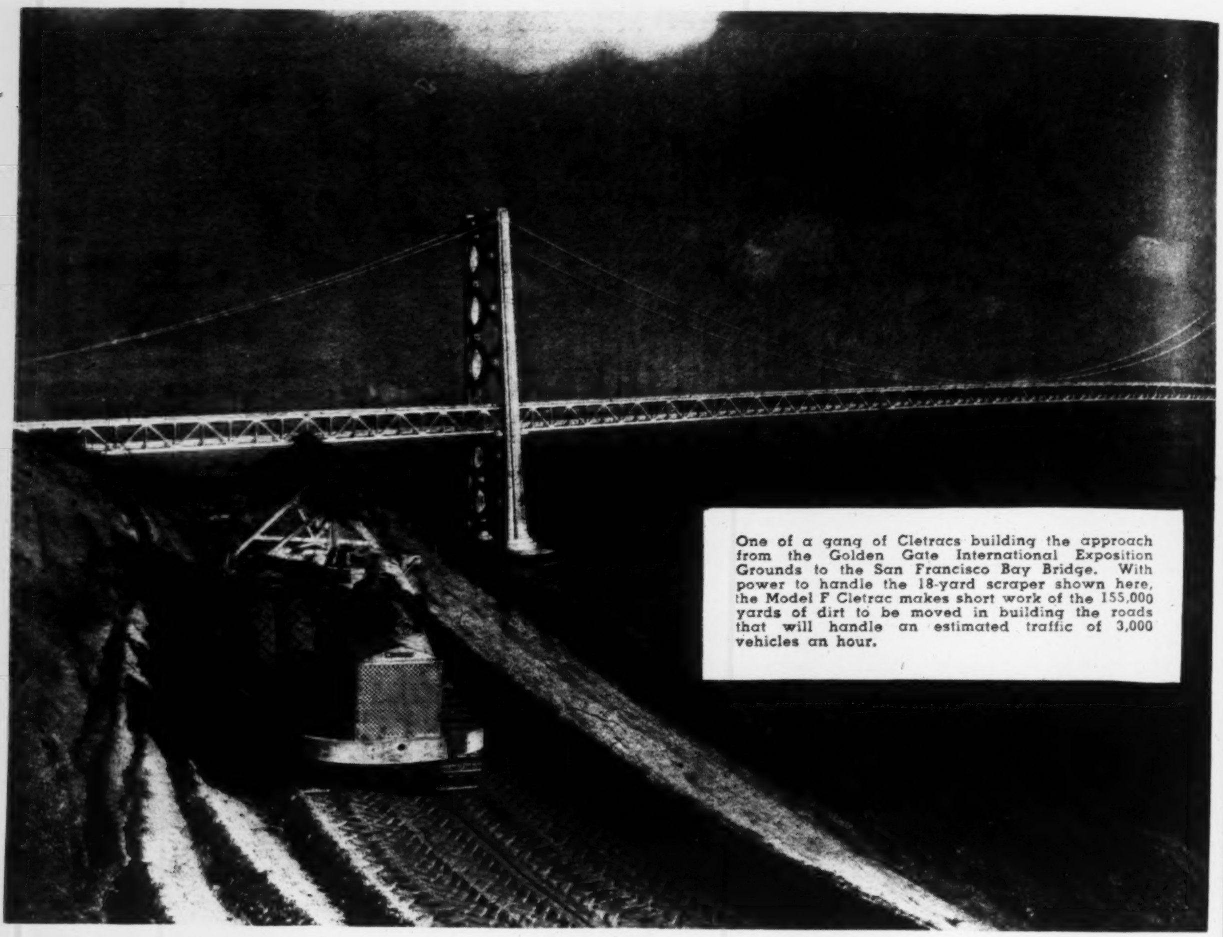
THE TRAFFIC HAND BOOK, 11th edition, is an interesting catalog of traffic reflectors, signs and warning signals—K. E. Erickson Co., Indianapolis, Ind., and Portland, Ore.

THE RECENT CHANGES in the design of the Hancock Flocontrol valves as well as tables of prices and dimensions are given in a new booklet—Hancock Valve Division, Manning, Maxwell & Moore, Inc., Bridgeport, Conn.

TECHNICAL DATA on and discussion of the advantages of the vacuum concrete process are contained in a new leaflet, "Vacuum Concrete Floor Finishes"—Vacuum Concrete Corp., New York City.

SAFEWAY STEEL SCAFFOLDING is described in an interestingly illustrated booklet—Uecker Equipment Co., Wauwatosa, Wisc.

THE MORSE filter plant, a rapid sand plant built entirely of steel, is described in some detail and interestingly pictured in a 10-page booklet—Chicago Bridge & Iron Co., Chicago.



One of a gang of Cletracs building the approach from the Golden Gate International Exposition Grounds to the San Francisco Bay Bridge. With power to handle the 18-yard scraper shown here, the Model F Cletrac makes short work of the 155,000 yards of dirt to be moved in building the roads that will handle an estimated traffic of 3,000 vehicles an hour.

Cletracs for the big jobs that need doing

Building the approach to a San Francisco Bay Bridge . . . moving the channel of a river . . . constructing a Pan-American Highway, a Fort Peck Dam, a New York World's Fair . . . wherever there is work to be done, schedules to be met, costs to be cut, you can depend upon Cletracs.

Cletracs cost less to operate. Efficient gasoline or Diesel engines cut fuel costs. Simplicity pares maintenance. Better construction, more able to stand the punishment of rough going, saves down-time. Controlled differential steering, an exclusive Cletrac feature, keeps both tracks pulling on the turns, to handle larger loads, move dirt faster.

In every way possible Cletracs save. They'll save for you. Ask for a demonstration on your own jobs . . . in your own conditions.

The Cleveland Tractor Company
Cleveland, Ohio

CLETRAC CRAWLER TRACTORS

The only tractors with controlled differential steering that keeps both tracks pulling at all times . . . on the turn as well as on the straightaway.

A Spark from a workman's shovel started it!

Our aluminum shovel would have prevented it!

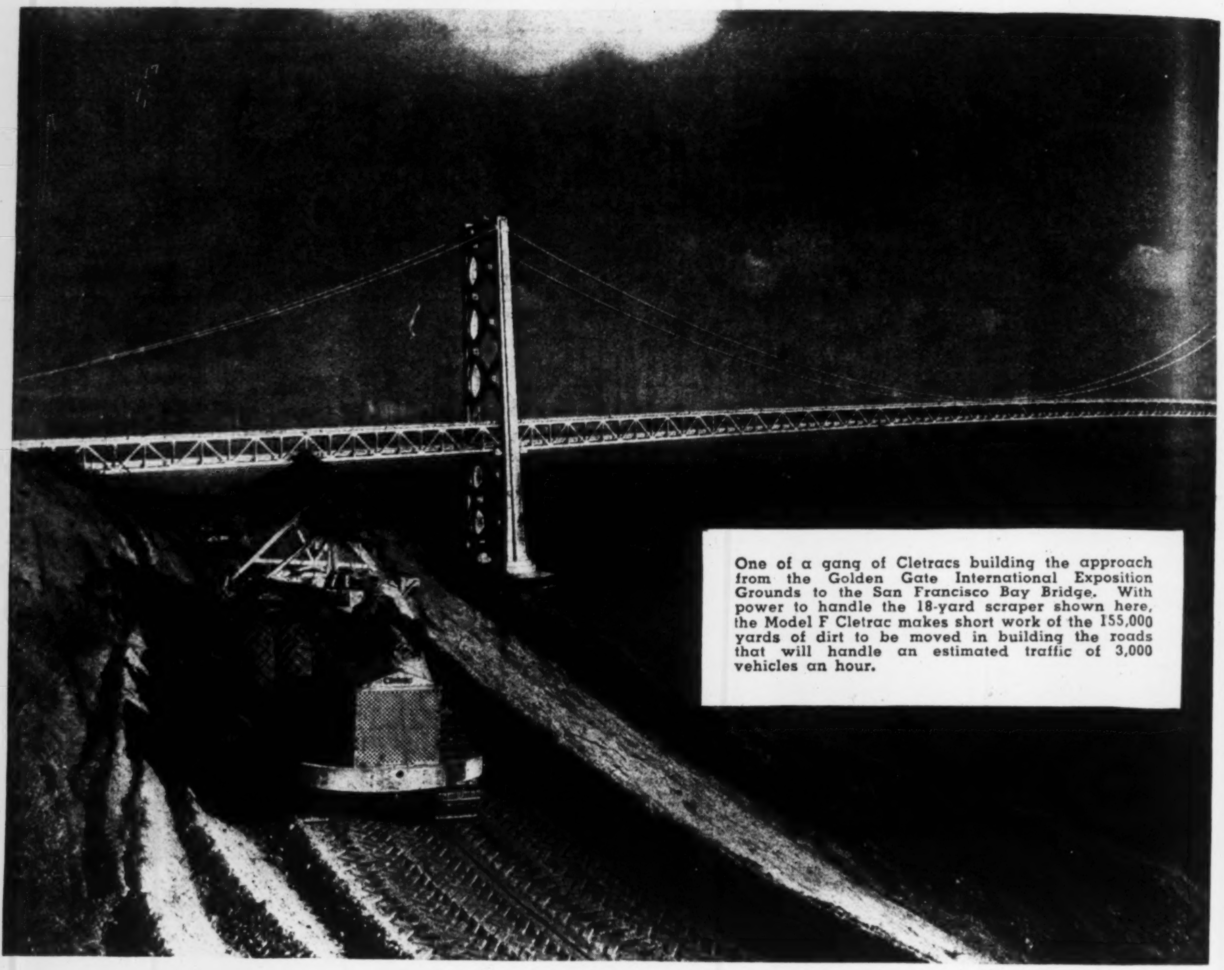
Wherever there is shoveling around combustibles there is danger of sparks and fire. That's why more and more industries, faced with hazards such as this, are turning to special WOOD'S Aluminum Alloy Shovels and Scoops.

Unlike the ordinary steel blade, the aluminum blade on these WOOD'S Shovels will not produce a spark when brought into sharp contact with metal, stone or other materials. Moreover — this remarkable blade is acid-resisting, and unusually light in weight.

How about strength? A locomotive fireman, testing a WOOD'S Aluminum Alloy Scoop, used it three months shoveling 25 to 30 tons of coal a day. The blade wore back barely half an inch! Also, a coal mining company tested the shovel for five weeks. They reported the shovel showed no appreciable signs of wear, and production increased to an almost unbelievable amount!

It will pay you to get complete details about the WOOD'S Aluminum Alloy Shovels, the WOOD'S "Moly" Shovels (the famous shovels with Molybdenum Steel blades) and other famous WOOD'S brands. Just address THE WOOD SHOVEL AND TOOL COMPANY, PIQUA, OHIO.

WOOD'S ALUMINUM ALLOY SHOVELS



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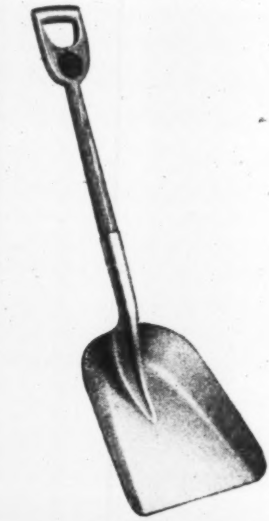

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WOOD'S ALUMINUM ALLOY SHOVELS

(Continued from page 766)

IRON AND STEEL PRODUCTS—BASE MILL PRICES

	STRUCT. SHAPES-PLATE	REINF. BARS ¾-in. billet *b*	RIVETS ¾-in. structural	WIRE NAILS Base	SHEET PILING Base	STEEL RAILS Per Gross Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle bars	Std. spikes *c*	Tie plates *c*	Track bolts
Birmingham	$2.40	$2.60	$3.70	$2.55	....	$42.50	$43.00	$42.00	$2.80	$3.15	$2.30	$4.35
Chicago	2.30	2.60	3.70	2.80	$2.70	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Pittsburgh	2.25	2.55	3.60	2.75*d*	2.60	42.50	43.00	42.00	2.80	3.15	2.30	4.35
Buffalo	2.35	2.60	....	....	....	....	....	....	....	....	2.30	
Cleveland	2.435‡	2.60	....	....	....	....	....	....	....	....	....	
Youngstown	....	2.60	....	....	....	....	....	....	....	3.15	....	
Gulf ports	2.65a	2.95a	....	....	3.05a	....	....	....	....	....	....	
Pacific ports	2.80a	2.95a	....	....	3.05a	....	....	....	....	3.15	2.40	

‡ Delivered. *a* F.o.b. cars dock. *b* For rail steel deduct 15c. from billet prices. *c* Other basing points include Portsmouth, O., Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., and Pacific coast ports, on tie plates alone, Steelton, Pa., on spikes alone, Lebanon, Pa., Richmond, Va. *d* Add switching charge $18 per c.l.

IRON AND STEEL PRODUCTS—F.O.B. WAREHOUSE, PER 100 LB., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb., base price	REINFORCING BARS Per 100 lb., ¾ in., base price 15 tons or over *b* New billet	Rail steel	Add $/cwt. for Switch	Del.	EXPANDED METAL LATH —Per 100 sq.yd., carload lots— Std. diamond mesh, 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING —Per 100 s.f., carload lots— 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires Per sq. yd.	SHEET PILING Per 100 lb. base price
Atlanta	$3.65	$2.82	$2.67	.02½	.10	$21.00	$23.00	$1.75	$1.31	$0.1692	$2.60
Baltimore	3.70	2.92	2.77	....	.10	23.00	25.00	1.62	1.22	.1566	3.00
Birmingham	2.40*a*	2.60	2.45	.02½	.10	22.50	24.50	....	....	.....	....
Boston	4.07	3.03	2.88	$20 C.L.	.10	21.60‡	23.60‡	1.68	1.26	.1620	3.02
Chicago	2.30*a*	2.60	2.45	.03	.05	23.00	25.00	1.61	1.22	.1557	2.70
Cincinnati	3.95	2.815*c*	2.665*c*	....	.05	25.01	29.50	1.60	1.21	.1548	....
Cleveland	3.86	2.60	2.45	.02½	.10	22.50	22.50	1.59	1.20	.153	....
Dallas	2.45	3.335	3.185	....	....	.....	.....	1.86	1.38	.1791	2.85
Denver	4.48	4.00	3.85	....	....	23.50	25.50	1.87	1.38	.1809	....
Detroit	3.95‡	2.70	2.55	....	.10	22.50	24.50	1.62	1.22	.1566	2.865
Kansas City	4.24	3.02*c*	2.87*c*	.0	.05	20.50	22.50	1.82	1.29	.1665	3.12
Los Angeles	3.825	2.95	2.80	.02½	.05	23.00	27.50	1.89	1.40	.1827	3.72
Minneapolis	4.00‡	2.90*c*	2.75*c*	.0	.10	26.00	30.00	1.71	1.28	.1656	3.003
Montreal	2.90	2.40	2.40	....	....	33.00	34.00	2.50	1.82	.253	3.50
New Orleans	....	2.94	2.79	.05	.10	21.00	23.00	1.76	1.31	.1701	....
New York	3.97	2.88	2.73	....	.10	21.50	23.00	1.67	1.26	.1584	2.93
Philadelphia	3.90	2.84	2.69	....	....	22.50	24.50	1.63	1.23	.1575	2.89
Pittsburgh	2.25*a*	2.55	2.40	.02½	.10	20.00	22.00	1.55	1.18	.1494	2.60
St. Louis	3.99	2.87	2.72	.0	.05	22.00/23.00	24.00/25.00	1.62	1.21	.1566	2.70
San Francisco	3.95	2.95	2.80	.02½	.10	24.50	26.50	1.89	1.39	.1827	3.50
Seattle	3.10	2.95	....	....	....	25.50	27.50	1.89	1.39	.1827	3.05

‡ Delivered. *a* Mill prices. *b* 5–15 tons, add 15c. 1–5 tons, add 25c. Less than 1 ton, add 50c. *c* 20 tons or over Base. *d* Mill price plus freight

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in. *a*	VITRIFIED SEWER PIPE Per foot, 8 in., s.s.	delivered, 12 in., s.s.	ASTM 24 in., d.s.	C13–35 36 in., d.s.	CLAY DRAIN TILE Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTM C 14–35 12 in.	24 in.	WROUGHT STEEL PIPE Full standard weight. *h* 1 to 3 in., Butt Weld Black %	Galv. %	3½ to 6 in., Lap Weld Black %	Galv. %
Atlanta	$50.00	$0.26*bc*	$0.468*bc*	$1.69	$4.50*c*	$85.00	$128.00	$0.45	$1.625	44.5	35.5	42	32
Baltimore	53.50	.30	.75	2.40	6.90	110.00	170.00	.40	1.60	....	....	....	....
Birmingham	46.00	.25	.45	1.625	4.66	85.00	220.00	.40	1.60	64.5	55.5	62	52.5
Boston	53.50	.224	.432	1.98	5.8425	99.00	153.00	.45	2.50	....	....	....	....
Chicago	54.50	.28	.54	2.25	6.25	100.00‡	150.00‡	.38	1.48	52.5	41.25	50.625	37.5
Cincinnati	53.00	.203	.3915	1.665	5.0225	75.00	120.00	.60	1.90	52.6875	41.4375	49.5625	37.6875
Cleveland	54.50	.154	.297	1.215	3.9975	69.00	108.00	.36	1.80	56	44.5	51.5	40.5
Dallas	58.00	.40	....	....	....	160.00	260.00	.46	1.57	69.5	61.5	67	58.5
Denver	66.00	.29†	.50†	2.10†	....	130.00	220.00	....	....	44	33	41	29
Detroit	52.40	.203	.3915	1.71	5.2375	76.50	130.00	.33	1.50	53.2	41.9	50.1	37.8
Kansas City	56.00	.30	.54	2.16	5.00	120.00	240.00	.45	1.60	49	37.6	45.8	34
Los Angeles	54.50	.282†	.508†	2.034†	5.085†	115.50	192.50	1.00	2.00	57.1	48.1	54.6	44.6
Minneapolis	57.00	.24†	.432†	1.728†	4.60†	......	......	.65	1.75	....	....	....	....
Montreal	55.00	.33†*e*	.59†*e*	2.04†*e*	....	82.00	134.00	.51	2.04	....	....	....	....
New Orleans	50.80	.26	.468	1.69	....	150.00	220.00	.45	1.65	....	....	....	....
New York	53.00	.28	.58	2.45	6.30	......	......	.50	1.50	52.49*i*	41.53*i*	48.20	37.80*i*
Philadelphia	50.00	.224	.45	2.25	6.00	150.00	180.00	.54	1.80	64.5*i*	55.5*i*	62.*i*	52.5*i*
Pittsburgh	56.00	.182†	.351†	1.62†	4.92†	97.80	154.20	.85*g*	2.00*g*	64.5*j*	55.5*j*	62*j*	52.5
St. Louis	53.00	.28	.504	1.728	3.96	85.00	160.00	.80	2.00	51.125	39.875	48	36.125
San Francisco	55.00	.315*d*	.567*d*	2.268	5.67	103.50	172.50	.45	2.50	53	44	42.75	33.33
Seattle	55.50	.294	.441	2.142	5.355	68.00	160.00*f*	.60*f*	1.60*f*	37	27	37	24

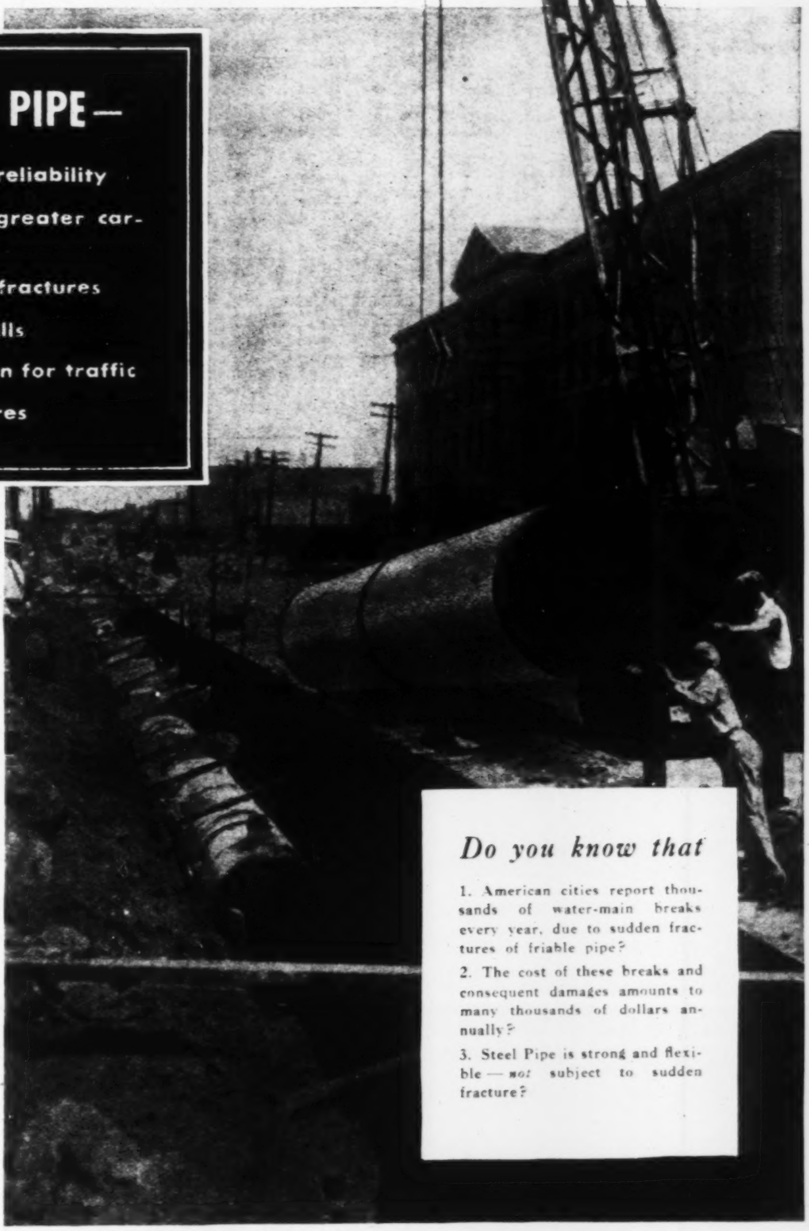
‡ Delivered. † F.o.b. *a* B. & S. class B and heavier, C/L lots, 200 tons and over Burlington, N. J. (base) $50.00. Gas pipe and class A, $3 per ton additional, 4 in., $3 per ton additional, 30 in. and larger usually $2 per ton less. *b* Double strength. *c* List to dealer. *d* List. *e* Sales and municipal taxes extra. *f* Less 5% for cash. *g* Culvert pipe. *h* Discounts from standard list for delivery from warehouse, except Pittsburgh prices are f.o.b. mill. Base price $200 per net ton. List prices per ft.: ½ in., 8½c.; ¾ in., 11½c.; 1 in., 17c.; 2 in., 37c.; 2½ in., 58½c.; 3 in., 76½c.; 4 in., $1.09; 6 in., $1.92. *i* Resale price to consumer, car load lots shipped from mill. *j* Applies also at Lorain, Ohio, mills. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, O., Chicago Dist. Billing is from point producing lowest price at destination. WROUGHT IRON PIPE: Base price and list prices per ft. same as wrought steel pipe. Discount for Pittsburgh base: Buttweld — 1 in. and 1¼ in. black 30, galv. 14; 1½ in. black 34, galv. 16½; 2 in. black 33½, galv. 16. Lapweld — 2½ in. to 3½ in. black 27½, galv. 12½; 4½ in. to 8 in. black, 28½ galv. 15.

(Continued on page 34)

Why the trend toward STEEL Water Mains?

Because STEEL PIPE—

1. Offers greater all-round reliability
2. Has low friction loss . . . greater carrying capacity
3. Eliminates risk of sudden fractures
4. Saves money on repair bills
5. Helps to keep streets open for traffic
6. Withstands higher pressures



Do you know that

1. American cities report thousands of water-main breaks every year, due to sudden fractures of friable pipe?
2. The cost of these breaks and consequent damages amounts to many thousands of dollars annually?
3. Steel Pipe is strong and flexible — *not* subject to sudden fracture?

THESE are the reasons why far-sighted city engineers are weighing more carefully the inherent advantages of steel pipe—and specifying National Steel Pipe—for underground water-main construction.

National Steel Pipe has proved beyond question that it has the reserve stamina to resist the strains that frequently cause damage to less reliable material. Engineers' reports from all sections of the country show that it stands up under the constant vibration of heavy street traffic and the stresses of trench pressures, cave-ins, settlements, washouts, and similar external forces.

In addition, the use of National Steel Pipe results in low maintenance costs. Its clean, smooth *in*terior means less friction and full flow capacity. Its clean, smooth *ex*terior is ideal for the application of special coatings needed if pipe is laid in severely corrosive soils.

NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, ***Pacific Coast Distributors*** · United States Steel Products Company, New York, ***Export Distributors***

UNITED STATES STEEL

(Continued from page 32)

LUMBER, TIMBER, PLYWOOD—PER M FT. B.M., CARLOAD LOTS F.O.B.

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir planks No. 2 common; Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)

LONG LEAF Y. P.: Merchantable grade up to 20 ft.
PLYWOOD: Rail freight increment (See note for base price)

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR									LONG LEAF Y. P.		PLYWOOD	
	1x6, S4S	1x8, S4S	2x4, S4S	2x6, S4S	2x8, S4S	2x10, S4S	3x12, Rgh	6x12, Rgh	12x12, Rgh	2x12, Rgh	12x12, Rgh	5/8"	3/4"
Atlanta	$16.00	$16.00	$15.50	$15.50	$16.00	$17.50	$22.00	.....	.....	$40.00	$50.00	$16.80	$20.50
Baltimore	30.00	30.00	33.00	33.00	33.00	35.00	45.00	.....	.....	68.00	68.00	16.45*f*	20.05*f*
	36.00	*30.00*	*37.00*	*35.00*	*35.00*	*35.00*	*40.00*	*$40.00*	*$38.00*	.....	.....	.....	.....
Birmingham	19.00	19.00	19.00	19.00	19.00	22.00	30.00	30.00	30.00	.....	.....	15.55	18.95
[1]	23.00	23.00	26.00	26.00	26.00	31.00	54.00	.....	.....	48.00	53.00	.....	.....
Boston	32.00[2]	32.00[2]	35.00[3]	35.00[3]	52.00[1]	60.00[1]	70.00[1]	.....	.....	70.00	70.00	16.45*f*	20.05*f*
	32.00	*32.00*	*35.00*	*35.00*	*35.00*	*40.00*	*40.00*	*45.00*	*45.00*	.....	.....	.....	.....
Chicago	28.50	28.50	30.00	30.00	30.00	38.00	40.00	.....	.....	75.00	75.00	12.45	15.15
	35.00	*35.00*	*39.00*	*39.00*	*39.00*	*44.00*		*42.00*	*42.00*				
Cincinnati	29.50	30.50	29.50	29.50	30.50	31.50	44.50	.....	.....	52.50	38.50	15.55	18.95
	.....	.....	.....	.....	.....	.....	*48.50*	*48.50*	*48.50*	.....	.....	.....	.....
Cleveland	30.00	31.00	37.00	30.00	39.00	40.00	52.00	*42.00*	*45.00*	52.00	65.00[6]	15.90	19.40
Dallas *e*	30.00	31.00	33.50	29.50	32.00	33.50	52.50	51.00	69.50	62.50	89.50	13.15	16.05
Denver ‡	46.00[4]	46.00[4]	50.00[4]	49.00[4]	49.00[4]	55.00[4]	54.00[4]	64.00[4]	67.50[4]	.....	.....	9.35	11.35
Detroit	27.00	27.00	27.00	27.00	27.00	29.00	38.00	.....	.....	32.00	44.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	*43.00*	*43.00*	*43.00*	.....	.....	.....	.....
Kansas City	24.00	24.00	24.00	23.00	25.00	26.00	40.00	.....	.....	55.00	60.00	11.45	13.95
	29.00	*29.00*	*30.00*	*29.00*	*29.00*	*30.00*	*34.00*	*38.00*	*38.00*	.....	.....	.....	.....
Los Angeles *a*	*36.00*	*35.00*	*36.00*	*35.00*	*37.00*	*37.00*	*41.00*	*48.00*	*43.00*	.....	.....	8.90*fg*	10.80*fg*
Minneapolis ‡*b*	54.00[6]	54.00[6]	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.45	13.95
‡	*45.00*	*45.00*	*48.00*	*46.00*	*46.00*	*47.00*	*65.00*	67.00	67.00	.....	.....	.....	.....
Montreal [7]	*46.00*	*48.00*	*52.00*	50.00	54.00	69.00	84.00	.....	.....	.....	.....	.....	.....
	54.75	*54.75*	*49.25*	*60.75*	*60.75*	*64.25*	*47.00*	.....	.....	.....	.....	.....	.....
New Orleans	33.00	36.00	42.50	34.00	40.00	39.00	50.00	.....	.....	54.00	59.00	13.15	16.05
	28.90	*31.50*	*35.90*	*29.50*	*33.00*	*34.00*	*38.00*	.....	.....	.....	.....	.....	.....
New York ‡	35.00	36.00	35.00	36.50	36.50	38.00	43.00	.....	.....	80.00	82.50	16.45*f*	20.05*f*
‡	.....	.....	*43.00*	*43.00*	*43.00*	*43.00*	*42.00*	*45.00*	*45.00*	.....	.....	.....	.....
Philadelphia	22.50	24.00	23.50	24.00	25.00	26.00	28.50	.....	.....	67.00	67.00	16.45*f*	20.05*f*
	37.00	*37.00*	*35.25*	*36.00*	*37.00*	*37.00*	*37.00*	*43.50*	*43.50*	.....	.....	.....	.....
Pittsburgh	38.10	39.90	47.05	42.00	45.65	46.90	59.70	.....	.....	.....	.....	16.20	19.70
	51.90	*49.60*	*49.60*	*49.00*	*48.90*	*49.25*	*66.55*	*66.55*	*66.55*	.....	.....	.....	.....
St. Louis ‡*c*	29.00	30.00	28.50	27.50	28.50	30.00	48.00	*55.00*	*55.00*	73.00	72.00	13.15	16.05
San Francisco *d*	*20.00*	*20.00*	*20.00*	*20.00*	*20.00*	*20.00*	*24.00*	*24.00*	*24.00*	.....	.....	6.95*f*	8.50*f*
Seattle	*22.50*	*23.50*	*23.50*	*22.50*	*22.50*	*22.50*	*26.00*	*26.00*	*26.00*	.....	.....	0.00	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* [1] Long leaf. [2] Roofers' N.C. Pine. [3] Spruce. [4] Native. [6] Western Pine, No. 3 Common. [7] Pine. [8] Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors in Minneapolis and St. Paul get 10% discount from list. *c* 5M ft. or less. *d* At ship's tackle. *e* 10% discount taken off.

Note: Special concrete form grade Fir Plywood, 4′ by 8′ panels, 5-ply, sanded 2 sides, water resistant glue, car load lots, delivered per 1000 sq. ft. surface. Base price — Seattle: 5/8", $63.75; 3/4", $72.75. For other centers add rail freight increment from table for proper size. Add: for form oil treatment, $2.50 per M. sq. ft.; for mineral paint sealed edges, $1.00 per M; for resin dipped treatment, $10.00 per M. *f* Lower rate by water shipment. *g* 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from latest jobbers list, Sept. 15, 1928 Single or Double Thickness		EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50-lb. cases delivered in 200 lb. lots*
	A quality	B quality	
Atlanta	85%	87%	$0.16
Baltimore	88%	87%	.16
Birmingham	87%	89%	.115
Boston	87%	89%	.16*d*
Chicago	86%	87%	.16
Cincinnati	89–10%	91–10%	.16
Cleveland	85–10%	85–10%	.20
Dallas	80%	80%	.175
Denver	85%	86%	.16*e*
Detroit	87–10%	89–10%	.16
Kansas City	86–10%	87–10%	.165
Los Angeles	90%*a*	90@40%	.1675
Minneapolis	84–10%	85–10%	.165
Montreal	60–30%	70–5%	.18†
New Orleans	88%*b* 85%*c*	86%*b* 80%*c*	.17
New York	89%	90%	.23*f*
Philadelphia	88%	89%	.16
Pittsburgh	86%	87%	.1525
St. Louis	88%	88%	.165
San Francisco	78%	83%	.165
Seattle	83%	86%	.1675

Price of 60% Ammonia Gelatin is $0.015 per lb. higher than 40%

a Disc. from list Aug. 1, 1929. *b* Single thickness. *c* Double.

* Urban prices influenced by service charges or local storage and delivery regulations, do not consistently reflect quantity prices in less congested areas. *d* Delivery charge of $4.00 for lots of 300 lb. or less. *e* F.o.b. Louviers, Colo. *f* In boroughs of Kings, Queens and Richmond, and in Manhattan south of Canal Street, add delivery charge of $6.00 per trip. †F.o.b.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla.	$0.115	$0.14	$0.16
W. of Miss., to Rocky Mtn. States, and Fla.	.12 –.13	.145 –.16	.165 –.18
Rocky Mtn. States	.12 –.1425	.14 –.155**	.16 –.175**
Pacific N. W. States	.1175–.13	.1475–.16	.1675–.18
Pacific S. W. States	.1150–.1275	.145 –.1525	.165 –.1725

** F.o.b. Louviers, Colo., or Butte, Mont.

PILES, TIES—F.O.B.

PILES

Prices per linear foot, pine, with bark on, f.o.b. New York; delivered from barge 1½ to 2c. per ft. additional:

Dimensions	Points	Length	Short Leaf Barge	Short Leaf Rail
12 in. at butt	6 in.	30 to 50 ft.	$0.18	$0.195
12 in.—2 ft. from butt.	6 in.	50 to 59 ft.	.225	.24
12 in.—2 ft. from butt.	6 in.	60 to 69 ft.	.23	.255
14 in.—2 ft. from butt.	6 in.	50 to 69 ft.	.24	.265
14 in.—2 ft. from butt.	6 in.	70 to 79 ft.	.265	.275
14 in.—2 ft. from butt.	5 in.	80 to 85 ft.	.38	.415
14 in.—2 ft. from butt.	5 in.	85 to 89 ft.	.42	.482

RAILWAY TIES

Prices f.o.b., per tie, for carload lots:		6″ x 8″ x 8′ Untr.	6″ x 8″ x 8′ Tr.	7″ x 9″ x 8′ 6″ Untr.	7″ x 9″ x 8′ 6″ Tr.
Boston	Oak	$1.20	....	$1.75	....
	Pine	1.20	$1.70*a*	1.80	$2.60*a*
New York	S.L. Sap Pine	1.00/1.10	1.80*g*	1.25	2.25*g*
	Mixed Oak	1.45	....	1.75	....
Birmingham	White Oak	.85	1.50*a*	1.35	1.70*a*
	Southern Pine	.55*b*	1.10*ab*	.70	1.30*a*
Chicago	Oak	....	1.67*ac*	....	2.05*ac*
	Oak	....	1.55*d*	....	1.90*d*
	Southern Pine	....	1.50*a*	....	1.95*a*
Los Angeles	Douglas Fir	.64	1.38*a*	.90	1.80*a*
Philadelphia	Red Oak	1.25	....	....	2.60*a*
St. Louis	White Oak	1.25	....	1.60	....
	Red Oak	1.20	1.60*a*	1.50	2.00*a*
	Sap Pine or Cypress	1.05	....	1.35	....
San Francisco	Douglas Fir	.80*bef*	....	....	1.85*caf*
Montreal	Birch or Maple	.70	1.10*a*	.80	1.40*a*

Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 6″ x 8″ x 8′ 6″ *c* Empty cell. *d* Zinc. *e* Green. *f* At ships tackle. *g* Dense pine

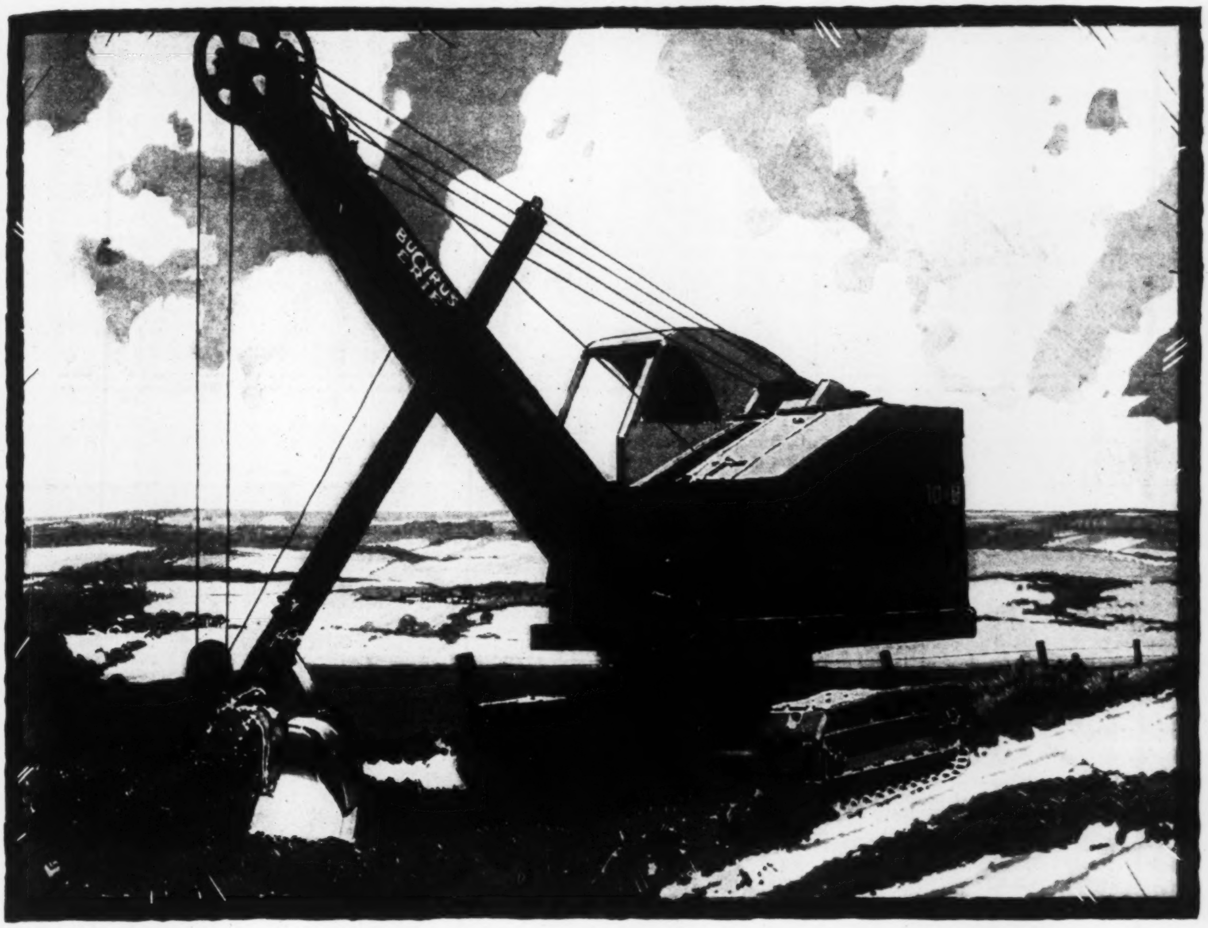
CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb.	$2.00–2.85
Chlorine cylinders, per lb. delivered	.055
Calcium chloride, 77–80%, flaked, in 400-lb. drums or 100-lb. moisture proof bags, f.o.b. works, freight equalized with points of competition, per ton	22.00–35.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb.	1.25
Soda ash, 58%, in paper bags, per 100 lb. dense	1.10
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	27.00–30.00
Sulphate of copper, in bbl., per 100-lb.	5.00–5.60

(Continued on page 36)

HIGHWAYS BUILT AND MAINTAINED WITH HERCULES POWER

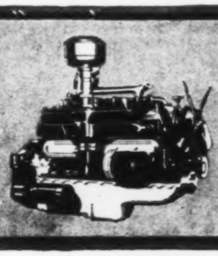


Power shovels such as the Bucyrus-Erie 10-B used by the Stephenson County, Illinois, Highway Department are only one of the many kinds of road-building and road-maintenance machinery powered by Hercules Engines. Both contractors and highway departments have long known that the name Hercules means efficient, economical, dependable power for mixers, ditchers, pavers, rollers, scarifiers, scrapers, snow plows, sweepers and other equipment to do every kind of highway job. The broad range of Hercules Engines and power units—both gasoline and Diesel—includes a type and model applicable to powered machinery in every phase of industry. Hercules' leadership is equally pronounced in automotive, agricultural, oil field, marine and industrial fields. Hercules has been building heavy-duty engines exclusively for more than twenty years.

HERCULES MOTORS CORPORATION, CANTON, OHIO

America's Foremost Engine Manufacturer • Power Plants from 4 to 200 H. P.

HERCULES



ENGINES

(Continued from page 34)

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE— PARTITION— SCORED Per M, lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE— LOAD BEARING — SCORED Per M, lots of 2,000 pieces or over,			BRICK Per M, in quantity,		LIME		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Per ton, Hydrated finishing	in paper, Common hydrated	carload lot Pulverized or lump
Atlanta	$63.20	$67.40	$126.30	$126.30	$147.40	$168.40	$10.75	$15.15	$18.50	$12.75	$12.75
Baltimore	93.00	100.00	185.00	225.00	320.00	395.00	13.00	17.00	20.00	15.00	25.00
Birmingham	78.75	84.00	157.50	189.00	201.25	242.00	15.00	19.00	3.00*o*	1.75*o*	2.25*lo*
Boston	86.25*ab*	92.00*ab*	172.50*ab*	195.90*ab*	211.65*ab*	242.00*a*	16.00*i*	19.00*i*	19.00	15.00	3.50*lp*
Chicago	66.00	70.50	132.00	180.00	228.00	260.00	11.00	12.00	15.50	14.00	12.00
Cincinnati	56.45	60.40	115.25	128.70	166.50	206.40	17.50	17.50	15.80	12.70	....
Cleveland	49.00	52.00	97.50	117.00	149.00	170.50	16.50	16.50	16.80*j*	14.40*j*	2.65*jm*
Dallas	59.00	62.00	125.00	149.00	155.00	177.00	9.50	24.00	19.00	16.00	.95*n*
Denver	78.50	88.00	141.50	166.50	196.00	222.50	12.00	15.50	25.00*j*	17.00*j*	25.00
Detroit	71.85	76.65	143.70	230.00	280.00	325.00	15.00	16.00	19.00	16.00	16.00
Kansas City	64.50	66.50	81.00*c*	125.50	159.75	186.25	14.00	24.00	18.90	12.60	10.50
Los Angeles	73.50†*r*	89.50†*r*	128.00*c*†*r*	210.00†*r*	368.00†*r*	460.00†*r*	12.00	14.00	18.70	.....	19.70
Minneapolis	80.35	85.70	146.00	192.85	176.20*d*	245.20*d*	13.10	15.10*g*	21.00	16.00	19.00
Montreal	84.00*a*	96.00*a*	180.00*a*	......	273.00	......	15.50†	20.75†	23.50	17.00	11.00
New Orleans	72.00	72.00	135.00	162.00	180.00	226.00	14.00	.....	18.30	12.60	.....
New York	87.00	93.00	128.00*c*	193.30*h*	238.80*h*	295.60*h*	13.50	.....	20.00	15.50	20.00
Philadelphia	85.30	91.00	170.50	204.60	252.00	312.00	.....	.....	16.10*q*	11.40*q*	10.90*q*
Pittsburgh	58.40	62.30	116.85	165.00	217.00	250.00	17.50	25.00	17.50	15.20	2.30*m*
St. Louis	62.00	65.00	120.00	180.00	234.00	280.00	16.00	17.00	.55*k*	.40*k*	2.25*m*
San Francisco	84.00	94.50	225.00	......	......	......	14.00	17.00	.55*o*	.40*o*	2.05*m*
Seattle	90.00	100.00	200.00	......	......	......	18.00*f*	18.00*f*	20.00*s*	20.00*s*	20.00*s*

a Smooth. *b* Carload lots delivered to job. *c* 6 x 12 x 12 in. *d* Not load bearing. *e* 8 x 8 x 8 in. only. *f* Less $1.00, ½ cash 15 days, balance 30 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* 50c per M off for cash. *j* LCL. *k* Per sack. *l* Lump. *m* Per bbl., 180 lb. *n* Per sack 100 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag. *q* 15-ton cars. *r* 5% discount 10 days 2% off cash. † F.o.b.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

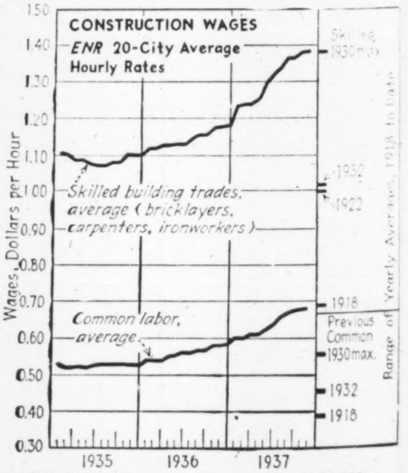
	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl.	WHITE LEAD	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES Carload lots f. o. b. factory				
	Dry *a*	Per 100 lb. in oil	Graphite *b*	Aluminum *c*	Ferric Oxide *d*	Rolls, slate surfaced, 85-90 lb., per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch, 350 lb. bbl., per ton
Atlanta	$9.25	$11.875	$1.62	$3.17	$1.40	$2.00	$2.00	$2.36	$.36	$28.00
Baltimore	9.00	11.50	1.45	2.25	1.70	2.16	2.75	2.75	.40	27.50
Birmingham	9.25	11.875	2.35	2.35	1.85	2.16	2.14	2.14	.45	29.25
Boston	9.00	11.50	2.00‡	2.30‡	2.11‡	1.96‡	2.25*h*‡	2.14*h*‡	.45‡	20.00‡
Chicago	9.00	11.50	1.80	....	....	2.47	2.37	2.37	.43	33.00
Cincinnati	9.00	11.50	1.45	2.50	1.40	2.40	2.39*h*	2.39*h*	.36	21.00
Cleveland	9.00	11.50	1.90	2.60	1.40	2.10	2.04*h*	2.04*h*	.305	27.50
Dallas	9.25	12.25	1.80	2.10	....	2.75*h*	2.50*h*	2.50*h*	.60	60.00
Denver	9.50	12.00	....	....	....	2.45	4.00	3.00	.35	28.00
Detroit	9.00	11.50	1.90	2.50	1.50	2.30	3.15	3.00	.35	30.00
Kansas City	9.00	11.625	2.15*g*	2.40*g*	1.67*g*	1.93	3.15	3.15	.25	25.00
Los Angeles	9.25	11.75	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	9.00	11.625	....	....	....	1.85*i*	1.78*hi*	1.78*hi*	.29	23.80
Montreal	.....	8.20	2.00*f*	4.75*f*	2.40*f*	2.50	1.60	1.83	.60	1.55*j*
New York	9.00	11.50	1.90	2.60	1.65	1.65	1.80*h*	1.80*h*	.033*e*	24.00
Philadelphia	9.00	11.50	2.515	2.94	1.515	1.95	2.86*h*	2.86*h*	.29	26.00
Pittsburgh	9.00	11.50	1.05	1.95	.80	1.95	1.94*h*	1.94*h*	.34	26.00
St. Louis	9.00	11.50	1.70/1.90	2.50/2.75	1.50/1.90	1.90/2.00*h*	2.70/2.80	2.70/2.80	.25/.35	28.00/30.00
San Francisco	9.25	11.50	1.80	2.75	1.10–2.00	1.80	2.62	2.62	.36	18.00
Seattle	9.25	11.75	1.80	2.85	2.20	1.98	2.42	2.60	.73	28.00*k*

‡ Delivered. Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266-31. *d* 80% maximum ferric oxide. *e* Per lb. *f* Sales tax extra. *g* 5 gal. cans. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Per 100 lb. *k* Asphalt pitch.

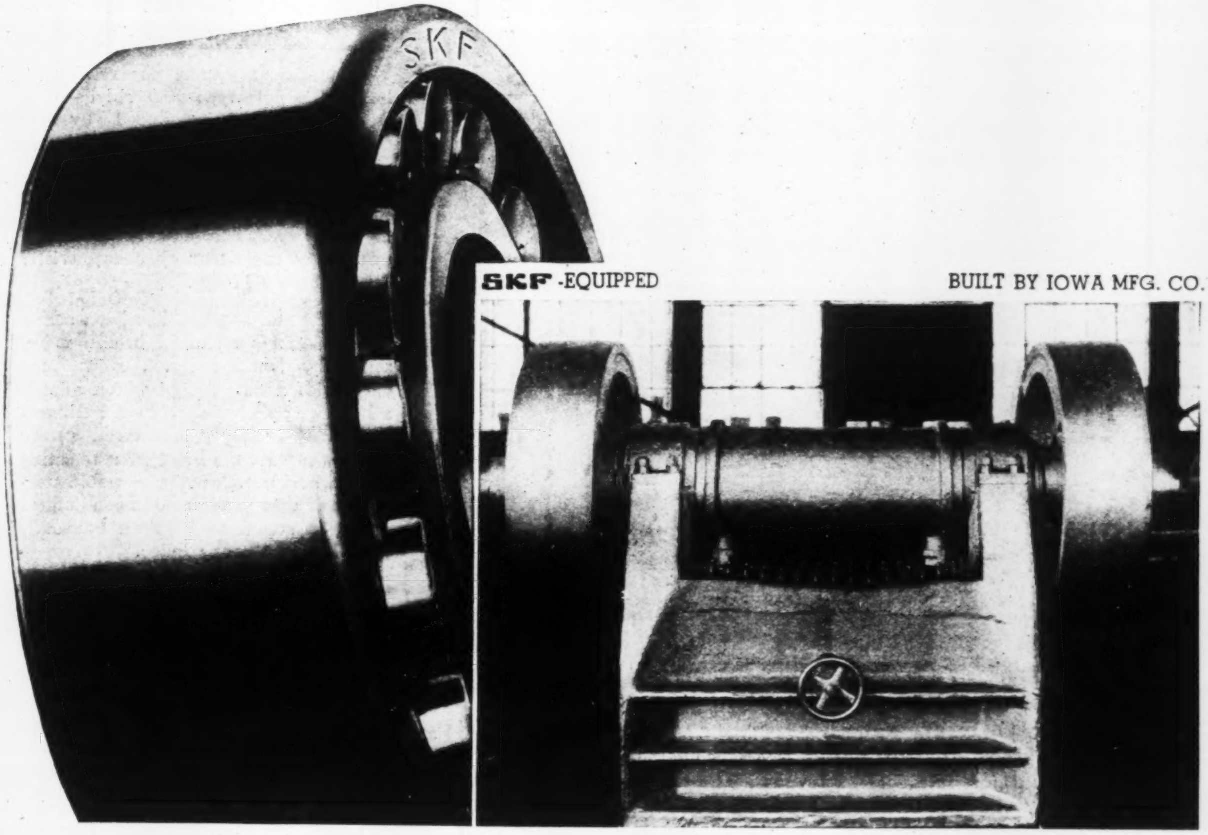
SKILLED AND COMMON WAGE RATES—PER HOUR

	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor	
						Building	Heavy Const.
Atlanta	$1.25	$0.40/1.00	$1.00/1.25	$1.00/1.25	$1.25	$0.40/.50	$0.40/.50
Baltimore	1.50	1.25	1.50	1.50	1.25	.50	.50
Birmingham	1.50	1.125	1.25	1.125	1.00	.30/.40*a*	.30/.40*a*
Boston	1.50	.90/1.375	1.375	1.00/1.375	1.625	.60/.85	.60/.85
Chicago	1.70	1.625	1.625*d*	1.625	1.70	1.025	1.025
Cincinnati	1.00/1.625	.70/1.35	1.40	1.00/1.40	1.00/1.625	.60/.75	.60/.75
Cleveland	1.625	1.375	1.50	1.50	1.50	.90	.90
Dallas	1.25	1.00	1.00	1.00	1.25	.40	.40
Denver	1.50*b*	1.50*b*	1.43*b*	....	1.43*b*	.714*b*	.714*b*
Detroit	1.50	1.25	1.50	1.50	1.55	.75/.80	.75/.80
Kansas City	1.50	1.375	1.50	1.50	1.575	.85	.45/.50
Los Angeles	1.10	1.10	1.125	1.25	1.25	.625	.625
Minneapolis	1.375	1.25*e*	1.50	1.40	1.50*c*	.85	.85
New Orleans	1.00	.75/1.00	1.00/1.25	1.00	1.00	.30/.40	.30/.40
New York	1.886*b*	1.75*b*	1.925	2.00*b*	2.00*c*	.95	.875/.95
Philadelphia	1.50	1.00	1.375	1.50	1.375	.40/.50	.40/.50
Pittsburgh	1.75	1.50	1.50	1.25	1.75	.80	.70
St. Louis	1.50	1.25	1.75	1.57/1.75	1.50	.875	.45/.875
San Francisco	1.75*c*	1.50	1.50	1.50	1.65*c*	.75	.65
Seattle	1.60*c*	1.25*c*	1.50*c*	1.50*c*	1.60*c*	.90*c*	1.00*c*
Montreal	.80	.70	.75	.70	.80	.40	.35

a PWA *b* 7 hr. day. *c* 6 hr. day. *d* To be $1.70 after Dec. 1: *e* 35 hr. wk. *f* 30 hr. wk.



ENR Skilled Average: (Bricklayers, Carpenters, Iron workers) $1.382
ENR Common Average: $0.678.



SKF-EQUIPPED BUILT BY IOWA MFG. CO.

Crushers that depend on **SKF** *Roller Bearings*

CRUSH MORE ROCK

- **SKF** Spherical Roller Bearings have everything it takes to do a good job on this Cedar Rapids Jaw Crusher.

Self-aligned, self-contained units with full carrying capacity, they have equalized load distribution . . . long life. They have the endurance to take punishing shocks today and every day for years. Sealed against dust, dirt and lubricant leakage, the only attention they require is greasing once or twice a year.

When the heart of your crushing plant runs on **SKF** Bearings, you can be sure of bearing performance that means more profits on the job.

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SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

MORE THAN
1200
TYPES AND SIZES

Industry comes to SKF for unbiased bearing counsel because SKF makes practically all types of anti-friction bearings.

SKF

BALL AND ROLLER BEARINGS

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news

High Speed Tractor

Road speeds of better than 25 miles an hour can be obtained by the new track-laying tractor just introduced by Marmon-Herrington Co., of Indianapolis. These speeds are attained on a gasoline consumption of from 4 to 5 miles per gallon.

The new rubber and cable type B. F. Goodrich track is used in combination with Marmon-Herrington patented suspension. The track is a continuous band of rubber, smooth on the inner surface and with traction lugs on the outer surface. It has a core of 20 to 30 endless, flexible steel cables gripped at intervals by the track guide and drive lugs. The drive sprockets impart their power directly to the cables and the rubber is used only as a cushioning medium. With the use of these tracks and the special suspension, the rolling resistance of the unit is said to have been reduced to the point where a brake is necessary.

The steering clutches are of a new type, air-cooled and mechanically operated. Incorporated with an auxiliary booster system.

• • •

EQUIPMENT IN BRIEF

Designed Primarily for residential loads, the new type I-30 single-phase watthour meter introduced by the General Electric Co., Schenectady, is a wide-limit meter having a performance equivalent to four sizes of previous types, the 5-, 10-, 15-, and 25-amp. ratings. The new meter has a practically flat accuracy characteristic from 0.5 to 60 amp.

A New Handwheel has been added to the Jenkins standard bronze valve, made by Jenkins Bros., New York City, with a new design which affords a large gripping area without bulkiness and has a deeply depressed center which prevents the hand from touching a hot wheel nut. A new renewable composition disc has also been added which is stated to have an unusually long life in steam service.

Absolute Pressure is measured directly by a new line of pressure indicating, recording, and controlling instruments developed by the Taylor Instrument Co. of Rochester, N. Y. The new pressure instrument incorporates an automatic compensation for variations in barometric pressure.

• • •

Smaller Hug Lugger

A new Hug lugger, Model 20, has been announced by The Hug Co., Highland, Ill., in an 8 cu.yd. capacity. Embodying an unusually high dumping angle hoist with complete hoist control at all angles, the new model contains the features of the larger Model 30 Hug lugger.

The chassis is arc welded throughout, and the truck is powered by a Caterpillar diesel engine.

Asbestos-Cement Siding

Trafford Tile is a new composition of asbestos fiber and portland cement, for use as siding and partitions in industrial buildings, which is being introduced in this country by the Keasbey & Mattison Co. of Ambler, Pa.

The new material is a tough sheet, fire and weather resistant, of a natural gray color, and requiring no protective coating. The tile has a long life and becomes tougher and stronger with age under normal atmospheric conditions. It is corrugated for increased strength.

The tile is produced in standard lengths from 3 to 8 ft. and in areas ranging from 11 to 29 sq.ft. Asbestos-cement accessories to be used with Trafford Tile, such as corner rolls, are furnished by the manufacturer as required.

The Steel in JACKBITS

is made for one purpose ONLY

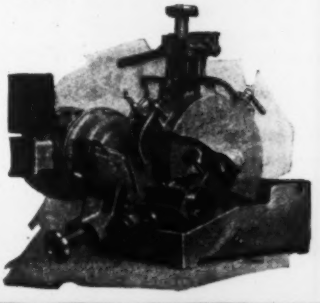
to cut rock

The use of Jackbits has many advantages. Nipping and steel hoisting costs are reduced, drilling is faster and cheaper, the original investment in drill steel is less, and upkeep costs on drills are lower.

But the most outstanding advantage of Jackbits is that they are made from steel which is made for one purpose only — to cut rock.

The photo on the left shows the hardness area of a particular size and type of Jackbit. The correct hardness for each bit is obtained only by much research and scientific heat treatment in modern precision equipment. A wide knowledge of rock drilling conditions combined with modern metallurgical and factory equipment result in a heat treating technique that permits the maximum number of regrinds for each bit. It will pay you to know more about Jackbits.

Ask for booklet No. 2304 which contains prices and full information.



I-R "Jackbit" Grinder

Air-, Electric- or Gasoline-Engine driven. Footage from Jackbits can often be increased three or four times by resharpening with the Jackbit Grinder.

Atlanta
Birmingham
Boston
Buffalo
Butte
Chicago
Cleveland
Dallas

Denver
Detroit
Duluth
El Paso
Hartford
Houston
Knoxville

Ingersoll-Rand

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Los Angeles
Newark
New York
Philadelphia
Picher
Pittsburgh
Pottsville

Salt Lake City
San Francisco
Scranton
Seattle
St. Louis
Tulsa
Washington

374-15

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news

DEMPSTER DUMPSTER
DEMPSTER DUMPSTER

Garbage Collector Unit

Dempster Brothers, Inc. of Knoxville, Tenn. has recently added to their line of Dempster-Dumpster portable containers, units in 2- and 3-cu.yd. capacities for use on municipal garbage and rubbish collection and disposal.

The unit consists of bottom-dumping containers and a hoisting apparatus for mounting on a $1\frac{1}{2}$-ton truck chassis by means of which one-man handling of the containers is possible. The Dempster plan for municipal use of the containers contemplates that the city purchase hoisting equipment and a few containers for public places. Building and store owners purchase the containers in which to deposit their own rubbish. A similar system is used in Britain.

The containers are equipped with hinged lids which may be locked. It is not necessary for the city to have keys, as the containers are dumped from the bottom and may be returned empty but still locked. The containers are also equipped with roller casters on the bottom to facilitate handling on the ground. They are said to be nearly airtight and to be fireproof, flyproof, vermin-proof and odor-proof. They are sold at a list price of $100 for the 2-yd. capacity and $150 for the 3-yd.

The hoisting unit is built to handle both sizes of containers. It is built for mounting on any make or model of truck. The hoisting unit is listed at a price of $985.

• • •

New Wall Panel

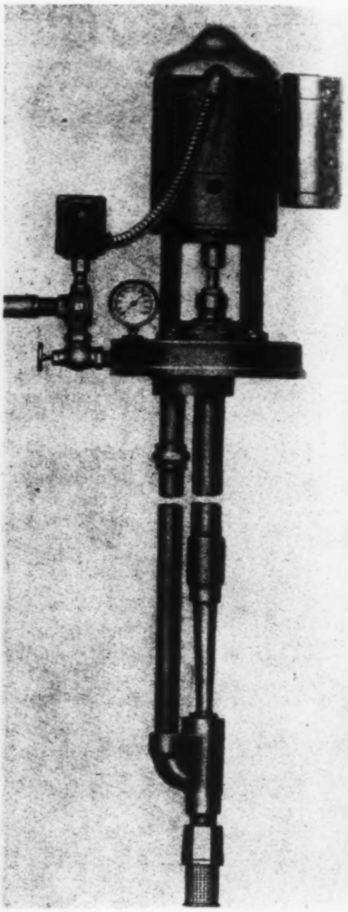
Asbestos-cement sheet finds a new use, as a protective surface covering for Celotex panels, in Cemesto, a wall and roofing product recently announced by The Celotex Corp., Chicago. Cemesto is composed of a core of Celotex, varying in thickness from $\frac{1}{2}$ in. to 2 in., surfaced on one or both sides with $\frac{1}{8}$ in. layers of asbestos-cement, thus combining insulation with fire and wear resistance. The outer covering is bonded to the Celotex by means of a waterproof adhesive.

Cemesto may be drilled and otherwise handled on the job with regular woodworking tools, and may be applied with nails, screws or bolts. It is manufactured in panels 4 ft. wide and from 6 to 12 ft. long.

• • •

Masonry Waterproofer

A new liquid compound for waterproofing any type of masonry, known as Mason-Seal, has been developed by the Calbar Paint & Varnish Co. of Philadelphia. The new composition is a weather seal of asbestos, treated oils, and color pigments, of heavier than ordinary paint consistency. Prepared in ten colors, it is applied with a brush and forms a weatherproof coating about 1/16 in. thick that will cover cracks up to 1/16 in. in width.



Compact Well Pump

A new vertically mounted motor-driven centrifugal pump for use in deep or shallow wells has been developed by Fairbanks, Morse & Co., Chicago. It is adapted to pumping water under high or low pressure at 6 to 60 gal. per min.

Units for shallow well service consist of a combined motor, pump and base, into the bottom of which is screwed a single suction pipe extending below the water level. This is used in water lifts of 15 to 20 ft.

For deep wells with a lift of 20 to 200 ft., an ejector and venturi in one of two drop pipes extending from the pump down into the well is added. The pump operates on the principle of the centrifugal, with the ejector added to lift water from depths beyond that from which the pump alone will lift it. By allowing a predetermined amount of water from the pump discharge to bypass down one of the drop pipes in the well and back up through the ejector into the venturi, a vacuum is created above the ejector nozzle, drawing well water into the suction chamber. The model illustrated is for deep well use.

SPECIFY TRINIDASCO FOR ECONOMICAL, CONVENIENT PAVING

Trinidasco cold-laid paving mixtures, a new development in modern paving construction, will solve the problems of highway engineers who demand a durable asphalt pavement that can be laid cold.

Cold-laid mixtures made by the Trinidasco process utilize Trinidad Lake Asphalt, which is dispersed in a pulverized form into a mixture of mineral aggregate and a specially prepared fluxing agent. The unique characteristics of Trinidad Lake Asphalt—ductility, adhesiveness, cohesiveness and an inherent colloidal mineral filler—give Trinidasco mixtures qualities that will withstand heavy traffic under all climatic conditions.

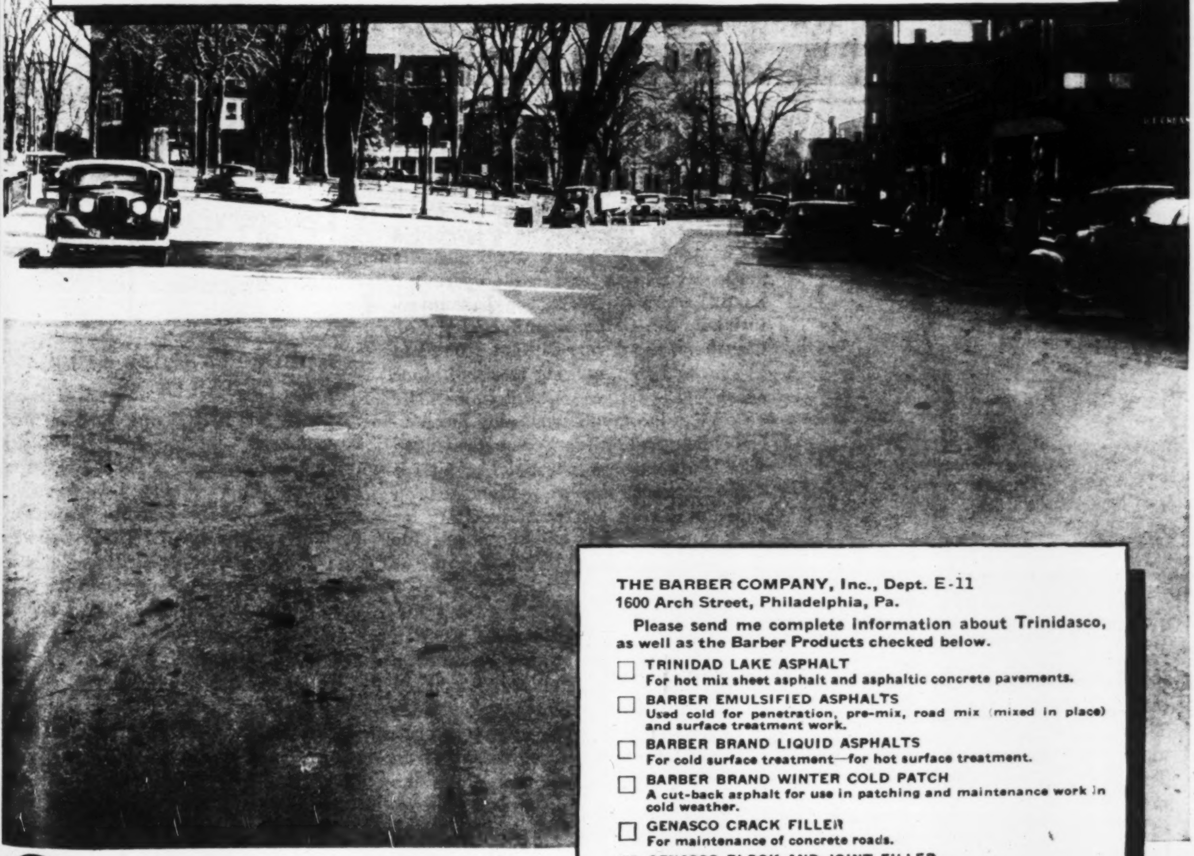
Trinidasco mixtures are economical . . . enduring . . . easy to lay. Furthermore, they are "traffic safe" . . . suitable for either new construction or maintenance purposes . . . can be hauled long distances to be used at once or several days after being prepared . . . do not "set up" until subjected to the pressure of rolling and traffic.

Highway engineers and others charged with the responsibility of constructing durable, economical roads can get more information about Trinidasco cold-laid mixtures by filling in the coupon shown below. Mail it today, pinned to your letterhead, and it will bring you complete information about Trinidasco, including a 24-page illustrated booklet—FREE.

TRINIDASCO

MADE WITH NATURE'S OWN

TRINIDAD LAKE ASPHALT

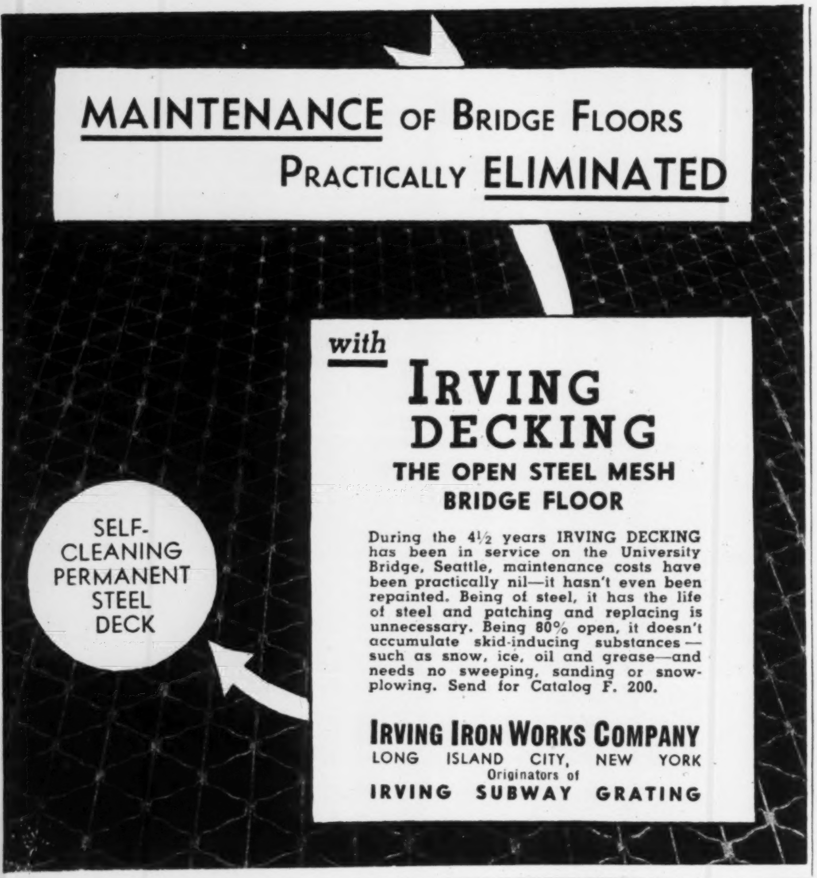


LIKE MANY STREETS IN AMERICAN CITIES, WASHINGTON STREET, HAVERHILL, MASSACHUSETTS, IS PAVED WITH TRINIDASCO

THE BARBER COMPANY, Inc., Dept. E-11
1600 Arch Street, Philadelphia, Pa.

Please send me complete information about Trinidasco, as well as the Barber Products checked below.

- ☐ TRINIDAD LAKE ASPHALT
  For hot mix sheet asphalt and asphaltic concrete pavements.
- ☐ BARBER EMULSIFIED ASPHALTS
  Used cold for penetration, pre-mix, road mix (mixed in place) and surface treatment work.
- ☐ BARBER BRAND LIQUID ASPHALTS
  For cold surface treatment—for hot surface treatment.
- ☐ BARBER BRAND WINTER COLD PATCH
  A cut-back asphalt for use in patching and maintenance work in cold weather.
- ☐ GENASCO CRACK FILLER
  For maintenance of concrete roads.
- ☐ GENASCO BLOCK AND JOINT FILLER
  For brick and granite block streets.
- ☐ CURCRETE
  An emulsified asphalt for curing concrete highways.



MAINTENANCE OF BRIDGE FLOORS PRACTICALLY ELIMINATED

SELF-CLEANING PERMANENT STEEL DECK

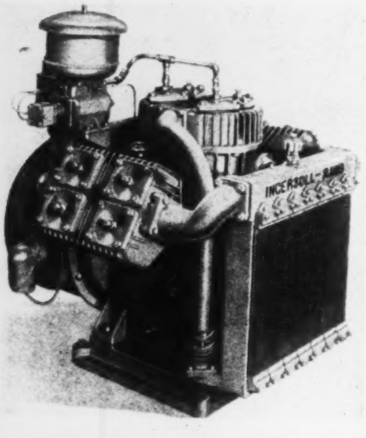
with

IRVING DECKING

THE OPEN STEEL MESH BRIDGE FLOOR

During the 4½ years IRVING DECKING has been in service on the University Bridge, Seattle, maintenance costs have been practically nil—it hasn't even been repainted. Being of steel, it has the life of steel and patching and replacing is unnecessary. Being 80% open, it doesn't accumulate skid-inducing substances—such as snow, ice, oil and grease—and needs no sweeping, sanding or snow-plowing. Send for Catalog F. 200.

IRVING IRON WORKS COMPANY
LONG ISLAND CITY, NEW YORK
Originators of
IRVING SUBWAY GRATING



Stationary Compressor

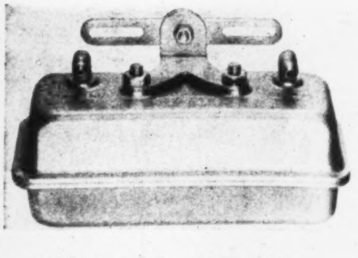
The Motorcompressor is a stationary vertical single-acting, two-stage air compressor recently developed by Ingersoll-Rand Co. of Phillipsburg, N. J. The Motorcompressor combines the motor and compressor as a single unit. The compressor crankshaft carries the motor rotor and the compressor frame carries the motor stator.

Sizes available range from 15 to 75 hp., for discharge pressure from 80 to 125 lb. per sq.in. Piston displacements range from 79 to 445 cu.ft. per min.

Pipe Cutting Machine

A torch-type pipe-cutting machine which does not require the use of cams, templates or special fixtures is guided by a mechanism which duplicates the motion of a torch held in the operator's hand. Known as No. 222 and manufactured by the Oster Manufacturing Co., Cleveland, the device will cut pipe from 2½ in. to 12 in., making tees and other specials as well as cutting holes. The case containing the generator mechanism is mounted on four legs with flanged wheels running on a track. The pipe is centered in a vise and supported on roller pipe rests for straight cutting for butt or tee welding, and the adjustable torch carrier is brought into the proper position.

The settings of the generating mechanism are regulated by the position of a rotating lever which operates a reciprocating slide. The lever is marked to show the settings for the various sizes and types of cuts. The reciprocating slide controls the movement of an oscillating lever which reproduces the movement in the torch carrier. The rotating lever is moved by a hand wheel located at the side of the generating mechanism case which also produces the drive for rotating the torch carrier ring around the pipe.



Cleanable Oil Filter

An oil cleaner for automobile and truck motors which requires no replacement of parts, being cleaned about every 20,000 miles, has been developed by Permanent Oilfilt'eer, of Chicago.

The filter consists of a die-cast aluminum case, weighing 1¾ lb. and measuring 8x3¼x3½ in., which contains three brass wire screens, a No. 40, a No. 50 and a No. 60. The different size screenings from these screens are collected in catch basins at the bottom of the filter and may be cleaned out periodically.

• • •

Pozzolith Demonstrated To Engineers

Some 200 engineers were the luncheon guests of the Master Builders Co. in New York City Oct. 27 to witness a demonstration of Pozzolith, a new admixture for concrete whose use permits a marked reduction in the water required for placeability and as a result increases the strength and durability. The demonstration was in charge of E. W. Scripture, Jr., director of research, and Robert L. Mauchel, vice-president in charge of sales of the eastern division of the company.

• • •

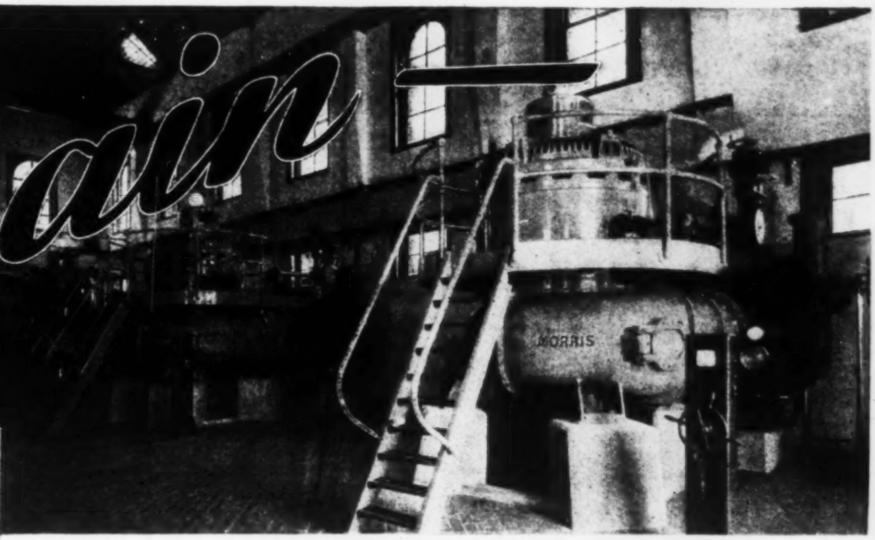
Rubber Crawler Tractor

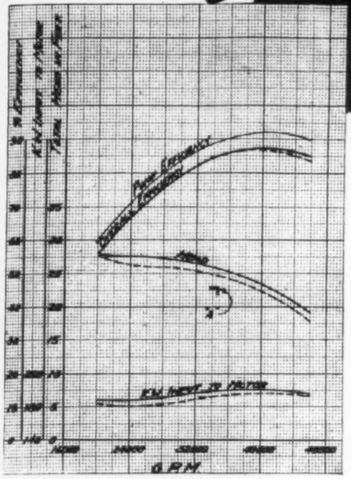
Increased tractive power, less injury to pavement, fuel saving ranging from 20 to 60 per cent and the possibility of tractor speeds as high as 60 miles an hour are claimed for a new rubber crawler track for tractors which has been developed by the B. F. Goodrich Co., Akron, Ohio. It is stated that in test runs an average speed of 39.6 miles per hour has been maintained on this track for a continuous run of 1,000 miles.

The Goodrich rubber track consists of an endless rubber belt reinforced longitudinally with a number of steel cables. In addition to the cables, field driving members are vulcanized into the rubber and made an integral part.

The new rubber track is designed to be driven positively by means of sprockets, and interlocking guide links are said to make it impossible for the track to come off while in operation.

Again—





MORRIS sets a new high standard in centrifugal pump performance

THE highly successful installation of three 36-inch vertical mixed-flow Morris Pumps at the McMillan Pumping Station in Washington, D. C., is notable for several reasons.

These pumps were each originally specified to deliver 34,700 gpm of raw water to filters against a total head of 23 ft. The required efficiency was 90%. The government engineers later asked for greater capacity, and each of the Morris Pumps was designed for 38,000 gpm at the rated head without overloading the motors purchased for the smaller capacity. To do this meant developing a pump efficiency of 92%.

Skeptics claimed that this efficiency was impossible, and moreover, that the pumps had to operate submerged for maximum efficiency and to prevent vibration. They didn't know the capabilities of the Morris engineers and Morris designs.

On acceptance test, the pumping units earned a bonus for the contractor by exceeding the guaranteed performance, they operate quietly when delivering almost 40,000 gpm with more than 12 ft. static suction lift, and in daily operation are actually exceeding the performance obtained on official test. In addition, the load on the motors remains well within normal rating at all points from shut-off to maximum capacity.

Whatever may be your own pumping requirements—water supply, sewage, drainage, or general service—we can refer you to many an installation where Morris Pumps are setting new high standards in centrifugal pump performance.

Morris Machine Works . . Baldwinsville, N. Y.

Some other Morris triumphs

Three moderate size Morris Non-clogging Pumps which more than met specified conditions and guarantees after three other pump manufacturers admitted their inability to satisfy the requirements.

Four 36-in. Morris Sewage Pumps, each delivering 30,000 gpm against 25 ft. head with an efficiency in excess of 90%.

Four 24-in. Morris Double-suction Non-clogging Pumps required to operate at 83.5% efficiency over a capacity range from 10 to 20 MGD. The pumps developed well over 90% efficiency on test, corresponding to a power saving for each pump of $2000 per year under maximum conditions.

24-in. Morris Double-suction Horizontally-split Pump delivering 10,400 gpm against 20 ft. head at better than 90% efficiency.

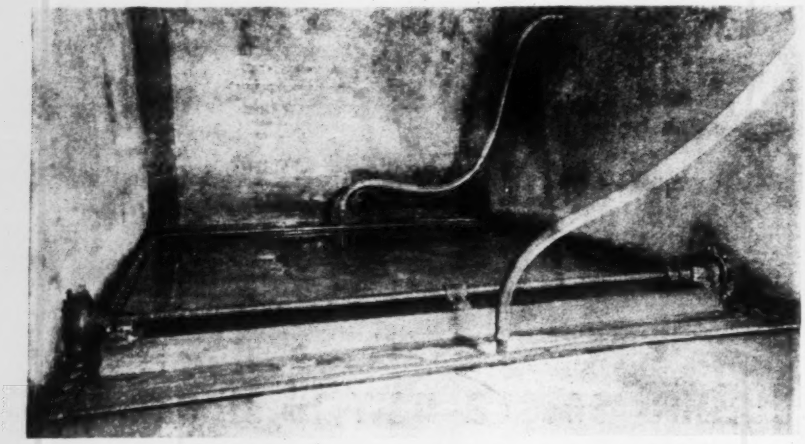
Four 48-in. Morris Propeller Pumps, each delivering 54,000 gpm against 26 ft. at 93% efficiency. Stated by the consulting engineer as the most efficient pumps he had ever tested.

MORRIS

CENTRIFUGAL PUMPS

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Vacuum Sludge Remover

A simple device for removing sludge from the bottom of rectangular settling tanks has recently been developed by the Chain Belt Co. of Milwaukee. The device consists of two nozzles, long enough to extend across the width of the tank and connected to a vacuum pump system by flexible tubing. The ends of the nozzles are fastened to a roller rack with a length half that of the tank, so that when one nozzle is at the center of the tank the other is at an end.

The rack is driven backward and forward by a central shaft extending through a stuffing box in the side of the tank and operated by an electric motor reversed at each stroke by a limit switch.

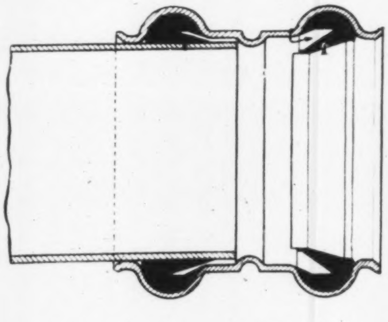
The company points out that this method of sludge removal avoids agitation of the liquid in the tank and that the simplicity of the mechanism permits the use of non-corrosive materials throughout the device at a comparatively moderate cost.

• • •

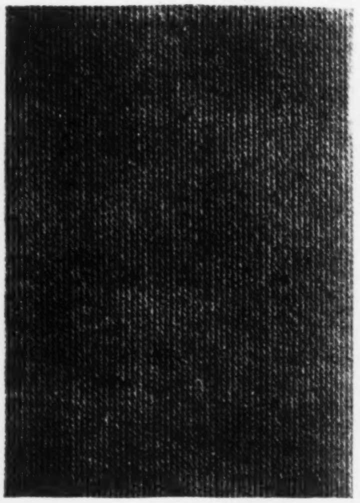
Temporary Pipe Connection

A flexible pipe coupling for plain end pipe, intended to be used in situations where frequent assembly and disassembly is necessary, has been developed by R. H. Pierce Manufacturing Co. of Eugene, Ore. The construction of the joint, which is so designed that the pressure of the water or other fluids is used to hold the joint tight against leakage, is said to permit substantial changes in alignment and rapid assembly or disassembly without the use of tools. For use on water lines, the gaskets are made of a live rubber composition and for lines using oil, gas, and chemicals, the manufacturers use gaskets made from a Neoprene compound manufactured by the duPont Co. of Wilmington, Del.

The device consists of a coupler band which slips over the edge of the plain end pipe and contains rings to carry two special gaskets. The gaskets, shown in solid black, contain a deep groove which is forced nearly shut when the coupler is pushed over the end of the pipe; water pressure, acting through the remaining opening of the groove keeps the seal tight against leakage.



The couplers are produced in sizes from 1 to 20 in. to fit all types of pipe, both thin-walled and standard weight. They are also being used on cement, asbestos and wood pipe.



Conveyor Belting

A type of construction in which the cords lie parallel and each cord is completely surrounded by rubber, is said to give an unusually long life to a new conveyor belting developed by the B. F. Goodrich Co. of Akron, Ohio. The new belting, known as Goodrich Cord Conveyor Belting possesses extreme transverse and longitudinal flexibility due to the absence of transverse or filler threads. The belt, it is said, will flex easily over small pulleys without setting up stresses.

Greater resistance to moisture and acid penetration is provided by the fact that the cord carcass is completely impregnated with rubber.

The belting is available in any length, width, and number of plies. The manufacturers point out that it is essential that the belt be spliced endless on the conveyor by means of portable vulcanizing equipment.

• • •

Prize Awards

Awards totaling $3,665 have been made to more than forty architects and designers by Structural Clay Products Institute, Inc., Washington, D. C. as prizes and honorable mentions in a group of competitions for designs and photographs of brick and structural clay tile houses.

First prizes of $500 were awarded to George D. Conner of Washington, D. C. for an original small house and to Atwell J. King of New York City for a 7-room house. Walter E. Conklin of Decatur, Ga. won first prize of $250 for photographs and plans of a completed 7-room house and T. H. Buell & Co., of Denver, were awarded first prize of $200 for a group of monumental buildings with architectural detail in brick and clay masonry.

"DRILL DOCTOR"

asks for help . . . Gets it!

Don't skimp on lubrication. Running dry for only a few minutes can ruin a drill. When they're getting enough oil, it will show on the drill-rod shank. Use Texaco, and be sure.

Texaco Compressor Lubricants keep rings and valves free and active, ports open. What carbon forms is dry, powdery, and blows out of the system.

LUBRICATING the rock drill of today is a problem of first importance, as any large user of this equipment well knows. In meeting the complexities of this problem, the "drill doctor" now calls to his aid as consultant, the lubrication engineer.

Texaco Engineering Service is operating in this capacity, because Texaco has the necessary lubricants to meet the needs of the "drill doctor."

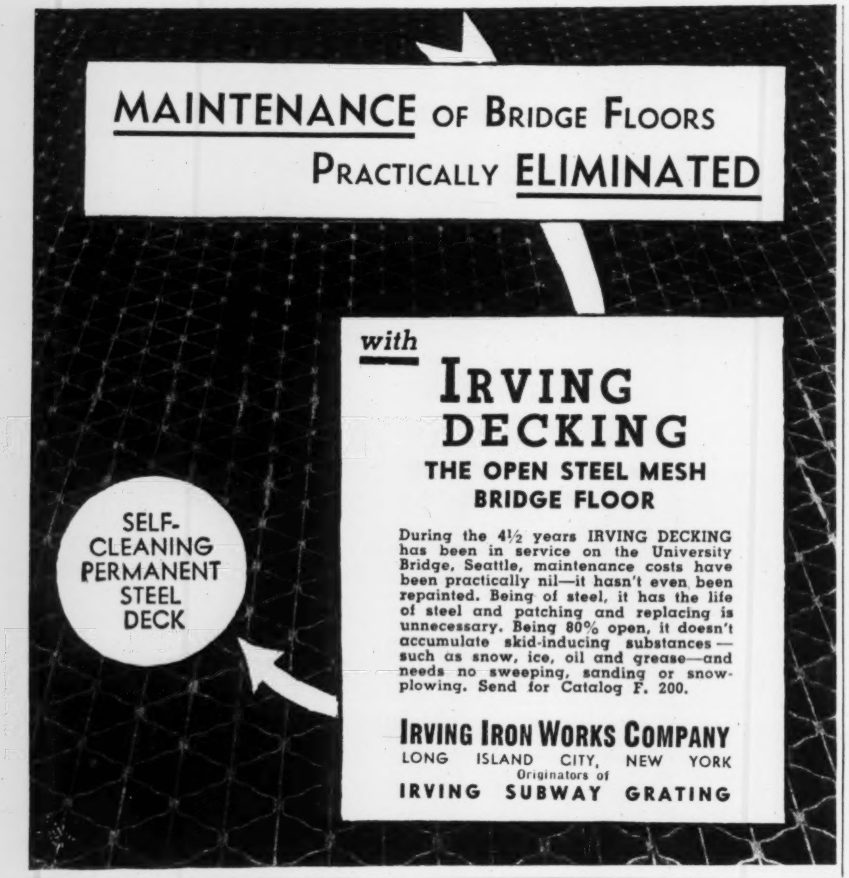
Climate, temperature range, design of the drill, are but a few of the considerations of lubrication. Obviously, no one lube can meet all of these. A lube successful in one section may not meet the conditions in another. Texaco's cooperative studies of pneumatic tool lubrication, carried on for years, assure you of our familiarity with your problem, and promise a satisfactory solution.

Trained lubrication engineers are available for consultation on the selection and application of Texaco Lubricants for rock drills. Prompt deliveries assured from 2070 warehouse plants throughout the United States.

The Texas Company, 135 East 42nd Street, New York City.

TEXACO T REG. T. M.

TEXACO *ROCK DRILL LUBRICANTS*


MAINTENANCE OF BRIDGE FLOORS
PRACTICALLY ELIMINATED

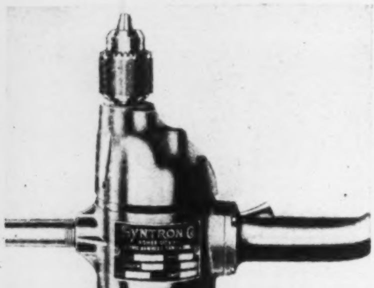
with

IRVING DECKING
THE OPEN STEEL MESH BRIDGE FLOOR

SELF-CLEANING PERMANENT STEEL DECK

During the 4½ years IRVING DECKING has been in service on the University Bridge, Seattle, maintenance costs have been practically nil—it hasn't even been repainted. Being of steel, it has the life of steel and patching and replacing is unnecessary. Being 80% open, it doesn't accumulate skid-inducing substances—such as snow, ice, oil and grease—and needs no sweeping, sanding or snow-plowing. Send for Catalog F. 200.

IRVING IRON WORKS COMPANY
LONG ISLAND CITY, NEW YORK
Originators of
IRVING SUBWAY GRATING



Portable Drill Line

Syntron Co. of Homer City, Pa. has brought out a complete new line of portable electric drills. The model illustrated is the ½-inch capacity Model No. 12-S. This ½-inch drill is of streamlined design, with rounded corners; cross-bar handles are provided as well as an end spade handle. The Universal motor is housed in an aluminum shell, and the reduction gears are all of heat-treated chrome molybdenum steel.

The drill is priced at $35.

Two New Unit Heaters

The line of unit heaters manufactured by the Trane Co., LaCrosse, Wis., has just been increased by the addition of two new types, the Trane Projection Heater and the Trane Multiple Projection Heater. Both heaters are designed to be placed in the ceiling of the room to be heated, and both incorporate the principle of drawing the warm ceiling air over heating coils and projecting it vertically downward at high velocity by means of four-bladed propellers.

The multiple heater, intended for use in situations where a large area must be heated with a minimum number of units, incorporates two, three or more propellers, individually controllable. This unit may be mounted as high as 30 ft. from the floor.

• • •

Colored Movie of Pipe

The U. S. Pipe & Foundry Co., Burlington, N. J., has recently prepared a colored silent motion picture showing Super deLavaud pipe-making.

Among the more interesting shots is a series taken inside the heat treating furnace showing the various colors of the pipe and undergoing treatment, at a temperature of about 1700 deg.

MANUFACTURERS' ACTIVITIES

THE FABRICATED STEEL PRODUCTS CO. of Wheeling, W. Va., has terminated its business, and patents and patent applications on their inside welded railings as well as production equipment have been sold to The Vulcan Rail & Construction Co. of Maspeth, N. Y.

THE WAREHOUSE at Houston, Tex., formerly operated by Carnegie-Illinois Steel Corp., and used jointly as the southern terminal by several subsidiaries of the U. S. Steel Corporation, has been placed under the management of the Tennessee Coal, Iron & Railroad Co. of Birmingham, in order to serve the southern steel trade more efficiently.

MARMON-HERRINGTON Co. has recently purchased the entire plant and machinery of Duesenberg Motors, Inc., of Indianapolis. The property consists of two large factory buildings and a 16-acre tract of ground. Marmon-Herrington expects to be in full production at this plant by Dec. 1.

Distributor Appointments

Five new distributors for tubular products of Republic Steel Corp. of Cleveland are: Bomar Gross, Inc., of Jamaica, N. Y.; Drake Supply Co. of Los Angeles; Iowa Machinery & Supply Co., Des Moines; Wilkins Pipe & Supply Co. of Peoria, Ill.; and Woodmanse Mfg. Co. of Freeport, Ill.

ELECTRIC HOSE & RUBBER Co. has opened a new Eastern sales office at Rockefeller Center in New York City.

WAREHOUSING facilities and supply service for Lincoln arc welding machines, electrodes and accessories, will be provided in Detroit by the newly formed Robinson Welding Supply Co., according to an announcement by The Lincoln Electric Co., Cleveland.

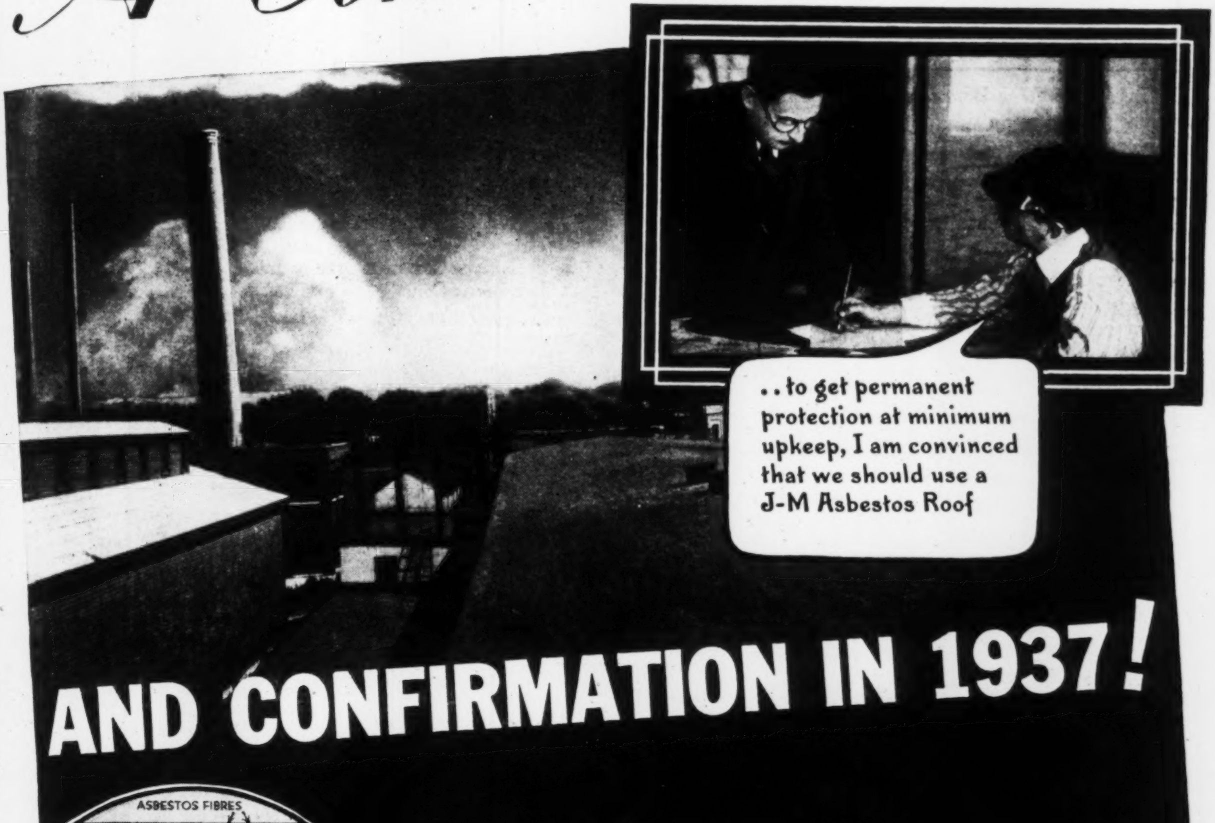
Personnel Changes

RALPH L. WILSON, formerly metallurgical engineer of the Timken Steel and Tube Division of the Timken Roller Bearing Co., has become metallurgical engineer in the development field for the Climax Molybdenum Co., Canton, Ohio.

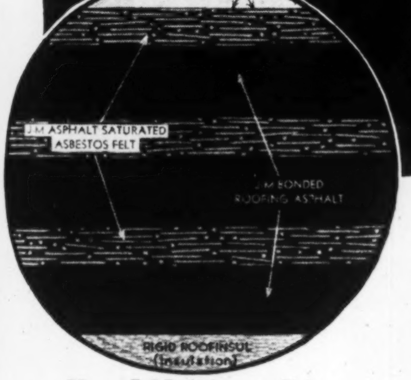
CHARLES H. KEENEY, who before 1928 had been associated for 18 years with the Connecticut Blower Co., of Hartford, has again become connected with that company as general manager and chief engineer.

W. E. RAGSDALE has been appointed manager of the Dallas office of Cutler-Hammer, Inc., of Milwaukee.

A Conviction in 1915


..to get permanent protection at minimum upkeep, I am convinced that we should use a J-M Asbestos Roof

AND CONFIRMATION IN 1937!


ASBESTOS FIBRES
J-M ASPHALT SATURATED ASBESTOS FELT
J-M BONDED ROOFING ASPHALT
RIGID ROOFINSUL (Insulation)

How J-M Asbestos Felts Protect the Waterproofing Asphalts from the Sun . . .

As this enlarged cross-section of a 3-ply J-M Asbestos Roof shows, each asbestos fiber is solid, non-capillary. The asphalt cannot penetrate into these fibers, or be *drawn up through them by the sun.* Hence, the asphalt—both within the felts and between the plies—retains indefinitely the lighter oils so essential to effective waterproofing.

IN 1915, a large papermaking-machinery company in upper New York State applied a built-up roof on the concrete deck over their foundry.

They were interested in securing lasting, low-cost protection for their investment in equipment and materials. And their belief in the superiority of J-M Asbestos Roofs has been more than confirmed today!

This particular J-M Roof, like scores of others throughout the country, is still in excellent condition as it nears the quarter-century mark. Explanation?

These roofs were built up with felts made of asbestos—the mineral that is fireproof, weatherproof, permanent.

But weather and fire are only two of the enemies of roofing life. A third—and equally serious one—is the sun. How its intense drying-out action is prevented by J-M Asbestos Felts is explained in the diagram and story on the left. Read the facts in that paragraph if you want the reason why J-M Roofs have established such an outstanding service record.

Valuable Book on Built-Up Roofs

"Specifications on J-M Bonded Built-Up Roofs" is a handbook giving data on roofing problems and complete information on all J-M Roofs. For your free copy, write to Johns-Manville, 22 E. 40th St., New York, N. Y.

JM Johns-Manville BONDED BUILT-UP ASBESTOS ROOFS

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

CALIFORNIA LEVEES

OWNER: U. S. War Department, Sacramento, Calif.

PROJECT: Construction of 11 miles of levees, involving 890,000 c.y., of fill along Bear River, South Dry Creek Lateral, Grasshopper Creek, and excavation along Grasshopper Creek Diverting Channel, forming part of the Sacramento River Flood Control project.

BIDS: Nine bids were opened in September, 1937, ranging from the contract low of $119,947 to a $202,084, with completion scheduled for October, 1938, and minimum hourly wage rates stipulated of 62½c. for common and $1.25 for skilled labor.

LOW BIDDERS:

1. Morrison-Knudsen Co., Los Angeles, Calif. (contract)	$119,947
2. D. McDonald, Sacramento, Calif.	128.340
3. Macco Construction Co., Clearwater, Calif.	130,414

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Levee embankment	867,000 c. y.	$0.103	$0.104	$0.109
2. Excavation	22,200 c. y.	.07	.20	.136
3. Road gravel	790 c. y.	1.00	3.00	2.00
4. Concrete, cl. A	21 c. y.	30.00	40.00	35.00
5. Reinforcing steel	1,200 c. y.	.07	.08	.08
6. Corr. pipe, 8 in., 14 ga	150 l. f.	1.80	2.10	2.15
7. Corr. pipe, 18 in., 12 ga	1,866 l. f.	4.30	4.70	4.50
8. Corr. pipe, 24 in., 12 ga	382 l. f.	5.70	6.10	5.00
9. Corr. pipe, 30 in., 12 ga	94 l. f.	7.00	7.80	8.25
10. Corr. pipe, 36 in., 10 ga	622 l. f.	10.00	10.90	12.00
11. Corr. pipe, 48 in., 11 ga	170 l. f.	14.00	15.70	16.00
12. Corr. cutoff sheet, 8 in. pipe	4 each	7.00	7.00	7.00
13. Corr. cutoff sheet, 18 in. pipe	40 each	11.50	12.00	11.50
14 Corr. cutoff sheet, 24 in. pipe	6 each	11.50	12.00	12.50
15 Corr. cutoff sheet, 30 in. pipe	2 each	17.50	19.00	18.00
16. Corr. cutoff sheet, 36 in. pipe	12 each	24.00	27.00	25.00
17. Corr. cutoff sheet, 48 in. pipe	2 each	31.00	33.00	30.00
18. Slide head gate, 18 in., 8 ft. frame	2 each	38.00	40.00	45.00
19. Slide head gate, 18 in., 6 ft. frame	4 each	35.50	39.00	40.00
20. Slide head gate, 24 in., 8 ft. frame	1 each	50.00	51.00	55.00
21. Slide head gate, 36 in., 12 ft. frame	2 each	106.50	103.00	110.00
22. Auto. drain. gate, 8 in	2 each	9.00	14.00	11.00
23. Auto. drain. gate, 18 in	14 each	33.00	34.00	40.00
24. Auto. drain. gate, 24 in	3 each	54.00	54.00	65.00
25. Auto. drain. gate, 30 in	1 each	125.00	111.00	120.00
26. Auto. drain. gate, 36 in	4 each	146.50	131.00	140.00
27. Auto. drain. gate, 48 in	1 each	400.00	530.00	375.00
28. Embankment protector	2 each	14.50	25.00	15.00
29. Galv. iron flange, 2 in. air vents	8 each	2.70	3.00	3.00
30. Galv. iron pipe, 2 in. air vents	63 l. f.	.37	.50	.36
31. Corr. pipe, 24 in. gate, remove	1 each	15.00	50.00	100.00
32. Concrete spillway, headwall, demolish	20 c. y.	6.00	5.00	5.00
33. Oil road surface, remove	260 s. y.	.25	.20	.10
34. Corr. pipe, 12 in., remove, reinstall	30 l. f.	.50	1.00	1.00
35. New fencing	41,585 l. f.	.075	.101	.10

SUBWAY TRESTLE, NEW YORK

OWNER: New York City Board of Transportation, J. B. Snow, chief engineer.

PROJECT: Independent Subway System extension into New York World's Fair grounds, from present Jamaica yards to Horace Harding Blvd. Spur will be 8,000 ft. long, all double track with third track for 2,100 ft., about three miles of track. Structure will be pile trestle with track just above ground level. Bents will be 12 ft. apart, timber caps, two 18x16-in. timber stringers under each rail. Piles average 45 ft. long; total number 7,000.

CONDITIONS: Contract time limit eight months. Future contracts will be let for track and equipment. Site is swampy.

BIDS: Nine proposals opened Oct. 15, 1937, ranging from $308,770 to $443,155.

LOW BIDDERS:

1. P. T. Cox Contracting Co., Inc., New York	$308.770
2. Del Balso Construction Corp., New York	345,950
3. Meads Engineering Co., Inc., New York	372,300

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Excavation	30,000 cu. yd.	$1.00	$0.70	$0.80
2. Timber piles, batter	108,000 l. f.	.54	.56	.85
3. Timber piles, vertical	145,000 l. f.	.54	.49	.80
4. Pile shoes	100 each	2.50	2.70	5.00
5. Pile load tests	5 each	250.00	350.00	450.00
6. Timber and lumber	1,450 M.b.m.	97.00	132.00	95.00

STEEL BRIDGE, ALASKA

OWNER: U. S. Bureau Public Roads; M. D. Williams, District Engineer.

PROJECT: Construction of steel span bridge, 0.179 miles long with approaches, over Salmon River on Texas Creek highway near Hyder, Alaska.

BIDS: Opened September, 1937. The four submitted ranged from the contract low of $34,997 to a high of $47,906, with contract awarded at Juneau, Alaska.

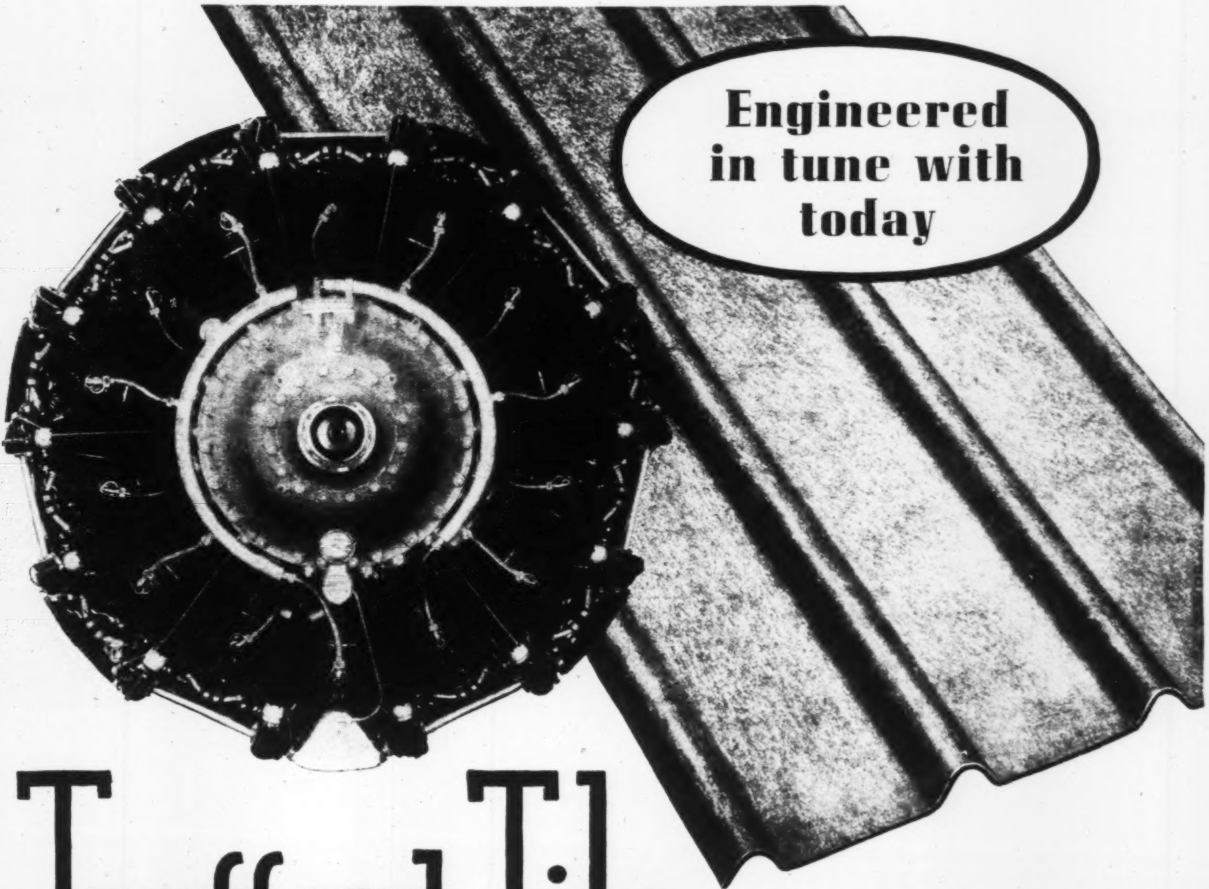
CONDITIONS: Contract is scheduled for completion within 240 days, with minimum hourly wages stipulated of $1.25 for skilled and 75c. for common labor. Construction must be done in the winter with 6 ft. of snow, the creek bed is boulders and glacial drift. The site is 150 miles off regular transportation lines. Steel will be fabricated in Seattle, dismantled and shipped either by special boat to Hyder or by regular route to Ketchikan, thence by transfer to Hyder. Camp is required at site and piers at one end are to be built beneath existing bridge, which is to be kept open as long as possible.

LOW BIDDERS:

1. Curtis-Gardner Co., Twin Rocks, Oregon (contract)	$34.997
2. R. H. Stock, Seattle, Washington	38.961
3. R. J. Sommers, Juneau, Alaska	40.535

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Structural steel	158,500 lb.	$0.11	$0.1262	$0.15
2. Clearing	0.7 acre	400.00	400.00	200.00
3. Grubbing	0.5 acre	600.00	400.00	400.00
4. Fine grading	0.138 mi.	1,000.00	1,000.00	1,000.00
5. Remove existing bridge	l. s.	500.00	3,500.00	500.00
6. Treated timber	27.5 M.b.m.	140.00	150.00	140.00
7. Excavation, uncl	900 c.-y.	2.50	1.50	2.00
8. Excavation, structural	290 c. y.	13.00	12.00	15.00
9. Gravel top course	160 c. y.	3.00	3.00	2.00
10. Concrete, cl. A	60 c. y.	55.00	50.00	50.00
11. Concrete, cl. B	30 c. y.	55.00	50.00	55.00
12. Rock embank., hand placed	35 c. y.	10.00	10.00	10.00
13. Overhaul, st. yd	20 c. y.	.20	.30	.10
14. Reinforcing steel	4,600 lb.	.15	.12	.10

(*Additional Contract Unit Prices on second following page*)



Trafford Tile has built-in strength

STRENGTH may follow sheer massiveness, or it may result from correct *design*. The modern aircraft engine gets its tremendous endurance from inherently strong materials scientifically shaped and applied.

In the same way Trafford Tile, a new asbestos-cement siding material for industrial buildings, gains strength and durability through a scientific distribution of the right material. Its corrugations are shaped and spaced to provide maximum strength with minimum weight. It retains, in addition, all the proved advantages of asbestos-cement . . . resistance to fire, weather, climate and the years.

It is ideal for the walls of permanent and temporary structures alike. The appearance is that of Roman Tiling, in a pleasing gray color. Needs no protective painting. Economical from the start. Let our engineering staff advise you on the many uses for this remarkable new building material.

KEASBEY & MATTISON COMPANY
AMBLER, PENNA.

K&M
best in asbestos

Send for information

Keasbey & Mattison Company
Ambler, Penna.
Please send us detailed information on
Trafford Tile.

NAME____________________

NAME OF FIRM____________________

ADDRESS____________________7-16

(Contract Unit Prices continued from page 28)

HIGHWAY UNDERPASS, IOWA

OWNER: Iowa State Highway Commission; F. R. White, Chief Engineer, Ames, Ia.

PROJECT: Underpass in Ames, Ia., on Grand Ave., U. S. No. 69, composed of 88.5 ft. continuous I-beam span, 32-ft. roadway and two 5-ft. walks at Main St.; 92-ft. three-span I-beam bridge over four railroad tracks; 77.5-ft. plate girder with I-beam approach spans for single track; also including grading, storm sewer, paving and street lighting system, with C. & N. W. R. R. to build track work and falsework.

BIDS: Five bids were submitted ranging from the contract low, awarded in September, 1937, for $282.822, to a high of $335.936, with completion scheduled for August, 1938, and minimum hourly wages stipulated of 75c. for skilled and 50c. for common labor.

LOW BIDDERS:

1. Ben Cole & Son, Ames, Ia. (contract)...... $282.822
2. Koss Const. Co., Des Moines, Ia............ 289,510
3. Massman Const. Co., Kansas City, Mo....... 305.397

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Concrete, Cl. A	1.085 7 c. y.	$20.00	$20.00	$21.00
2. Concrete, Cl. B	1.623 0 c. y.	17.00	18.50	21.00
3. Reinforcing steel	135,545 lb.	.04	045	04
4. Structural steel	1,111,533 lb.	.07	069	073
5. Wrought iron	175,160 lb.	.09	08	08
6. Creosoted piling	6.685 l. f.	1.00	1.00	1.10
7. Handrail steel	43.940 lb.	.13	14	.20
8. Untreated piling	8.580 l. f.	.70	.75	.70
9. Test piling	210 l. f.	2.00	2.00	3.00
10. Excav. Cl. 1	3.532 c. y.	1.50	3.00	3.00
11. Backfill	788 c. y.	1.00	75	.50
12. Fiber conduit, 3 in	132 l. f.	.50	50	1.00
13. Waterproofing	104 sq.	4.00	12.50	40.00
14. Asphalt plank	818 s. y.	3.00	1.75	5.00
15. Asphalt mastic	27 6 c. y.	21.00	80.00	60.00
16. Crushed rock	25 c. y.	3.00	3.20	4.00
17. Corr. pipe, perf., 6 in	361 l. f.	2.00	1.25	1.00
18. Corr. pipe, 6 in	272 l. f.	1.50	.75	1.00
19. Corr. pipe, semi-c, 8 in	1,042 2 l. f.	2.50	.75	1.00
20. End drains	58 l. f.	2.00	2.00	2.00
21. Store room specialties	L. S.	250.00	200.00	750.00
22. Lighting, wiring	L. S.	3,800.00	3,550.00	5,000.00
23. Roadway excavation	48,194 c. y.	.51	.50	40
24. Backfill, por. subgrade	4,196 c. y.	1.00	.95	1.00
25. Backfill, topsoil	1.942 c. y.	1.50	0.50	0.75
26. Sodding	7.500 s. y.	.20	.40	.20
27. Storm sewer comp., 30 in.	1.471 l. f.	11.75	12.50	9.00
28. Storm sewer comp., 24 in.	84 l. f.	3.00	3.00	5.00
29. Storm sewer comp., 18 in.	180 l. f.	2.00	2.00	3.00
30. Storm sewer comp., 15 in.	368 l. f.	1.40	1.70	2.50
31. Reinf. conc., headwall	1.96 c. y.	25.00	25.00	30.00
32. Drain tile comp., 12 in	822 l. f.	.75	.75	75
33. Drain tile comp., 8 in	1,140 l. f.	.45	.50	50
34. Drain tile comp., 6 in	1,875 l. f.	.40	.30	40
35. Backfill, por. tile	300 c. y.	3.50	2.50	2.00
36. Manholes	4 ea.	175.00	350.00	400.00
37. Intakes, 1 unit, type E	8 ea.	70.00	60.00	50.00
38. Intakes, 2 unit, type E	6 ea.	125.00	100.00	75.00
39. Intakes, 4 unit, type E	2 ea.	210.00	200.00	100.00
40. Intakes, 1 unit, type SG	6 ea.	23.50	100.00	75.00
41. Intakes, 2 unit, type SG	2 ea.	45.00	200.00	80.00
42. Sidewalk gutter plates	12 ea.	15.00	10.00	25.00
43. Concrete pavement	13,296 s. y.	2.50	2.50	2.85
44. Concrete sidewalk	17,000 s. f.	.20	.17	22
45. Concrete drives	5,850 s. f.	.25	.25	45
46. Conc. sidewalk-gutter	1,450 l. f.	.40	1.00	1.00
47. Surfacing material	330 c. y.	1.00	1.50	1.50
48. Metal culvert, corr., 24 in.	50 l. f.	2.00	2.50	3.00
49. Metal culvert, corr., 15 in.	100 l. f.	1.75	1.50	2.00
50. Galv. pipe, 2 in	1,824 l. f.	.60	.60	1.00
51. Sprinkler hydrants	16 ea.	20.00	35.00	25.00

SAN FRANCISCO PIPELINE

OWNER: San Francisco Public Utilities Commission; N. A. Eckhart, Chief Engineer.

PROJECT: Constructing 9,400 lin.ft. of 60-in. steel pipe as part of New Sunset Reservoir project located at Ortega, Pacheco, 24th and 28th Aves., San Francisco, Calif. Work includes the fabrication, lining and coating of steel pipe with and 153 lin.ft. of bell and spigot joints for fittings.

BIDS: Seven bids were opened in October, 1937, ranging from $214.820 to $242.035, with minimum hourly wages stipulated of $1.67 for skilled and 75c. for common labor.

LOW BIDDERS:

1. Williams Bros. and Haas, Inc., San Francisco, Calf. $214.820
2. Sibley Grading & Teaming Co., San Francisco, Calif. 219.810
3. MacDonald & Kahn, Ltd., San Francisco, Calif. 225.317

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Steel pipe, 60 in., coating	9,570 l. f.	$14.28	$12.95	$13.65
2. Roundabout seams	35 each	67.00	31.25	40.00
3. Excav., backfill up to 8 ft. depth	9,400 l. f.	3.75	5.57	5.00
4. Excav., backfill, 8 to 10 ft.	254 c. y.	6.00	7.50	2.70
5. Excav., backfill, over 10 ft. depth	406 c. y.	2.00	12.00	3.00
6. Excav. drains, backfill, normal	100 c. y.	2.20	5.00	3.50
7. Excav., backfill, blow off trench	100 c. y.	2.20	5.00	3.50
8. Remove, replace pavement	1,100 s. f.	.30	.35	.36
9. Drain installation	250 l. f.	1.20	1.00	.80
10. Steel pipe, 60 in	9,400 l. f.	1.83	1.98	2.15
11. Bell, spigot joints, fittings.	153 l. f.	.35	1.00	1.50
12. Fitting installation	40,000 lb.	.07	.04	.04
13. Repaving	57,000 s. f.	.30	.24	.35

MISS. RIVER CHANNEL MARKERS

OWNER: U. S. War Department, Rock Island, Ill.

PROJECT: Construction of channel markers in the pools of Lock and Dam Nos. 10 and 11, in the Mississippi River near Rock Island, Ill.

BIDS: Eight bids were opened in October, 1937, based on invitations for proposals for 54 markers for pools of lock and dam Nos. 10, 11, 16, 18 and 20. Two bids only were received for the five pools: $96.922 and $102.031. Contract only awarded at this time for Pools 10 and 11 on which four bids were received ranging from the contract low of $48.866 to $52.780. Unit prices of the three low bidders on Pools 10 and 11 follow.

LOW BIDDERS:

1. Siems-Helmers, Inc.. St. Paul. Minn. (contract). $48.866
2. Graus Const. Co.. Hastings. Minn............ 50.462
3. S. A. Healy Co.. Chicago.................... 51.940

Items	Quan.	Unit Prices (1)	(2)	(3)
GROUP I — POOL No. 10.				
1. Clearing	L. S.	$700.00	$380.00	$1,000.00
2. Excavation	375 c. y.	1.00	2.00	1.50
3. Fill	675 c. y.	.90	1.50	1.50
4. Stone protection, crushed, gravel	350 c. y.	5.00	3.00	3.50
5. Stone protection, 1, 2 man stone	1,500 c. y.	4.25	4.00	5.00
6. Concrete	320 c. y.	32.00	31.00	32.00
7. Piling, round timber, vertical	2,430 l. f.	1.75	2.00	2.00
8. Piling, round timber, batter	525 l. f.	2.00	2.20	3.00
9. Steel, structural	4,025 lb.	.10	.10	.10
10. Steel reinforcing	14,100 lb.	.06	.05	.05
11. Forgings, steel	3,550 lb.	.16	.15	.15
12. Gage board	91 l. f.	2.00	2.00	2.00
GROUP II — POOL No. 11.				
1. Clearing	L. S.	500.00	275.00	500.00
2 Excavation	265 c. y.	1.00	2.00	1.50
3. Fill	775 c. y.	.90	1.50	1.50
4 Stone protection, crushed, gravel	250 c. y.	5.00	3.00	3.50
5. Stone protection, 1, 2 man stone	1,125 c. y.	4.25	5.00	4.50
6. Concrete	265 c. y.	32.00	35.00	30.00
7. Piling, round timber, vertical	1,765 l. f.	1.75	2.00	2.00
8. Piling, round timber, batter	375 l. f.	2.00	2.20	3.00
9. Steel, structural	3,080 lb.	.10	.10	.10
10. Steel reinforcing	13,800 lb.	.06	.05	.05
11. Forgings, steel	2,655 lb.	.16	.15	.15
12. Gage board	72 l. f.	2.00	2.00	2.00

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CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

LOUISVILLE SEWERS

OWNER. .Sewerage Commissioners, Louisville, Ky.; W. M. Cave, Engineer.

PROJECT: Construction of 1,100 lin.ft. clay sewer pipe, up to 18 in. diameter, comprising E.R.A. project No. 18, the Wellington Court contract, in Louisville, Ky.

BIDS: Seven bids were opened in October, 1937, with completion scheduled for 80 days by the low bidder, and minimum hourly wages stipulated of 70c. for skilled and 33 1/3c. for common labor. Contractor supplies all materials required for construction exclusive of manhole tops and castings.

LOW BIDDERS:

1. W. L. Hailey & Co., Nashville, Tenn. (contract)	$37,757
2. Charles E. Cannell Co., Inc., Louisville, Ky.	37,916
3. Columbia Const. Co., Louisville, Ky.	40,378

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Earth excav., backfill	1,127 l. f.	$9.00	$9.40	$8.50
2. Rock excav., backfill	1,960 c. y.	7.47	6.00	9.00
3. Concrete, cl. A	482 c. y.	19.00	23.00	20.00
4. Concrete, cl. A	20 c. y.	30.00	46.00	40.00
5. Concrete, cl. C	75 c. y.	14.00	14.00	10.00
6. Brick masonry	1 c. y.	35.00	35.00	25.00
7. Vitrified brick lining	10 s. y.	4.50	5.00	6.00
8. Reinforcing steel	12,000 lb.	.05	.07	.05
9. Earth excav. below sewer	50 c. y.	2.50	1.50	1.00
10. Gravel refill below sewer	50 c. y.	3.50	3.50	.10
11. A. S. T. M. clay sewer pipe, to 18 in. (percentage of $758.40)	p. c.	60 p. c.	55 p. c.	60 p. c.
12. Lay pipe, cement mortar, 6 in	525 l. f.	.35	.40	.30
13. Lay pipe, cement mortar, 8 in	10 l. f.	.35	.40	.30
14. Lay pipe, cement mortar, 10 in	10 l. f.	.40	.40	.30
15. Lay pipe, cement mortar, 12 in	10 l. f.	.50	.40	.40
16. Lay pipe, cement mortar, 15 in	80 l. f.	.60	.60	.40
17 Lay pipe, cement mortar, 18 in	10 l. f.	.75	1.00	.60
18. Lay underdrain, 4 in	500 l. f.	.30	.30	.40
19. Lay underdrain, 6 in	600 l. f.	.40	.40	.40
20. Asphalt pavement	80 s. y.	3.00	4.00	3.50
21. Progress and completion, $25.00 per day		80 d.	100 d.	90 d.

NEW ENGLAND HIGHWAYS

OWNER: State highway departments, Massachusetts, Maine and Vermont.

PROJECT: Four projects of bituminous concrete, cement concrete and gravel. All bids taken October, 1937. Description, location, bidders and unit prices given in following tabulations. Data courtesy New England Roadbuilders Ass'n.

I—Town of Dartmouth, Mass. Bit. conc., Cl. 1; 3,600 l.f., 10 to 32 ft. wide. Five bids, $14,074 to $19,292.

1. Sherry Corp., Fall River, Mass	$14,074
2. Frank Toner Est., North Attleboro, Mass	14,891
3. S. Triconi, Waltham, Mass	15,583

II—Town of Athol, Mass. Gravel surf., M.I.P.; 3,550 l.f. Seven bids, $6,879 to $8,934.

1. Geo. E. Duteau, Springfield, Mass	$6,879
2. V. Arcangeli, Westminster, Mass	7,212
3. Frank Briguglio & Co., Medford, Mass	7,640

III—Towns of Topsham and Bowdoin, Me. Reinf. conc., 20 ft. wide; 2.175 mi. Three bids $115,485 to $130,671.

1. Lane Const. Co., Meriden, Conn	$115,485
2. Bridge Const. Co., Augusta, Me	117,059
3. Wyman & Simpson, Inc., Augusta, Me	130,671

IV—Town of Dorset, Vt. Crushed gravel, M.I.P.; 1.444 mi., various widths. Seven bids $30,172 to $34,010.

1. T. J. Harvey & Son, Adams, Mass	$30,172
2. Troy Paving Co., Inc., Hudson Falls, N. Y.	30,490
3. Rome Const. Co., Holden, Mass	30,722

I — TOWN OF DARTMOUTH, MASS.

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Earth excavation	2,300 c. y.	$0.35	$0.40	$0.40
2. Ledge excavation	10 c. y.	2.00	2.00	3.00
3. Cem. conc. mas. Cl. D	1 c. y.	18.00	15.00	20.00
4. Broken stone base	470 c. y.	3.00	4.00	4.25
5. Bit. asphalt, OA-4	8,500 gal.	.09	.12	.11
6. Vit. clay, cem. conc. pipe, 10 in.	1,616 l. f.	.50	.45	.50
7. Vit. clay, cem. conc. pipe, 12 in.	404 l. f.	.65	.55	.59
8. Ctd. corr. metal pipe, 10 in.	18 l. f.	1.10	1.20	1.35
9. C.i. culvert, lt.wght.18 in.	46 l. f.	2.25	2.75	4.00
10. Catch basins	10 each	45.00	50.00	40.00
11. Remove, rebuild stone walls	180 l. f.	.40	.60	.55
12. Side drains, clay, metal pipe, 10 in.	44 l. f.	1.00	.60	1.50
13. Side drains, clay, metal pipe, 12 in.	556 l. f.	1.15	.55	1.50
14. Gravel borrow	1,900 c. y.	.50	.70	.55
15. Strip gravel pits	190 c. y.	.10	.10	.10
16. Gr. vert. curb, type B	470 l. f.	1.15	1.05	1.15
17. Manholes	9 each	45.00	50.00	40.00
18. Fine gr. Rl. & fin	8,300 s. y.	.03	.03	.03
19. Conc. curb inlets	8 each	12.00	10.00	7.00
20. Trench excavation	1,850 c. y.	.90	.70	.85
21. Loan borrow	130 c. y.	1.00	1.00	1.00
22. Trench ledge excava	50 c. y.	3.00	3.00	3.00
23. Seeding	700 s. y.	.05	.05	.20
24. Bit. concrete, cl. I	660 ton	6.00	6.50	6.40
25. Granite curb corners	3 each	10.00	7.00	8.00
26. Remove, reset cobble edgestone	265 l. f.	.30	.30	.35
27. Remove, reset cobble paving	25 s. y.	1.50	.50	1.00
28. Special catch basin	1 each	75.00	150.00	75.00
29. Conc. ext. stones	16 each	.50	2.00	2.00
30. Perf. ctd. corr. metal pipe, 12 in	130 l. f.	1.75	1.40	2.25

II — TOWN OF ATHOL, MASS.

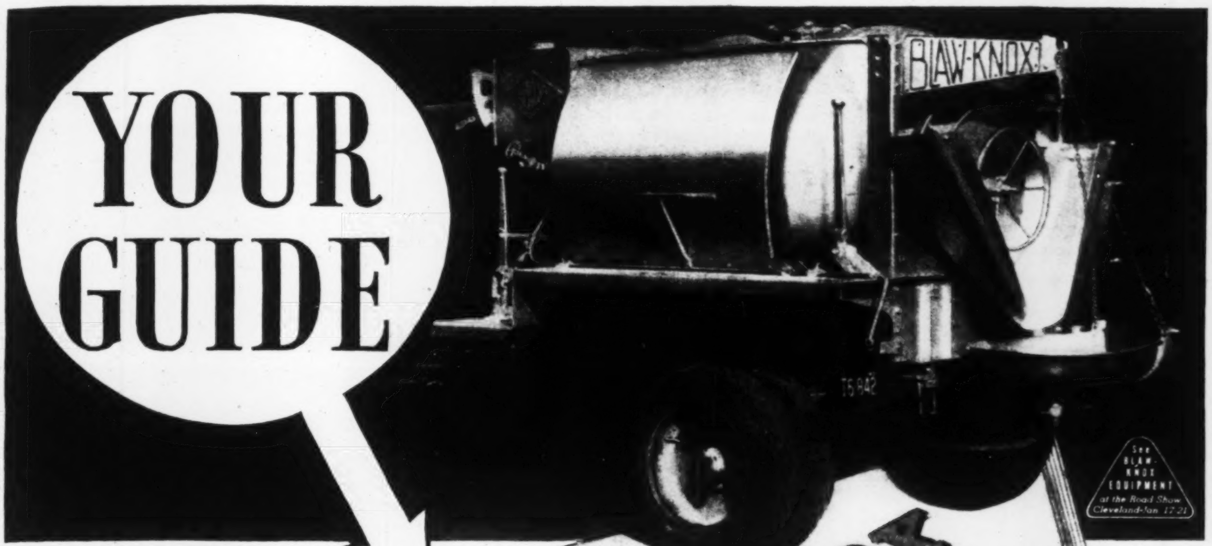
Item	Quan.	Unit Prices (1)	(2)	(3)
1. Earth excavation	1,500 c. y.	$0.50	$0.50	$0.47
2. Ledge excavation	150 c. y.	2.50	3.00	2.25
3. Cem. conc. Mas. cl. D	40 c. y.	17.00	16.00	20.00
4. Cem. conc. Mas. cl. C	3 c. y.	17.00	20.00	18.00
5. Tar, TM-1	8,800 gal.	.11	.13	.11
6. Vit. clay, conc. sewer, 12 in.	114 l. f.	1.00	.60	.55
7. Ctd. cor. meta pipe, 12 in.	148 l. f.	1.50	1.20	1.25
8. Ctd. cor. meta pipe, 18 in.	84 l. f.	2.00	2.00	2.25
9. Bounds	23 each	2.50	3.50	6.00
10. Remove trees	6 each	8.00	10.00	15.00
11. Gravel borrow	3,600 c. y.	.60	.50	.70
12. Sand borrow	110 c. y.	.60	1.25	1.00
13. Strip gravel pit	410 c. y.	.15	.20	.15
14. Gravel surfacing	510 c. y.	.75	.90	.85
15. Stock fence	610 l. f.	.20	.35	.40
16. Fine gr. rl. & fin	12,500 s. y.	.03	.03	.03
17. Reinf. cem. conc. strs	300 lb.	.07	.10	.06
18. Dry stone masonry	5 c. y.	5.00	8.00	7.00
19. Remove, relay vit. clay pipe, 12 in	40 l. f.	1.00	75.00	.75
20. Trench excavation	200 c. y.	.60	1.75	.95
21. Trench ledge excav	20 c. y.	3.00	3.00	3.50
22. Concrete guard posts	12 each	1.00	3.00	2.00

III — TOWNS OF TOPSHAM & BOWDOIN, ME.

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clear and grub	2 a.	$175.00	$100.00	$200.00
2. Earth excavation	15,000 c. y.	.95	.50	.60
3. Rock excavation	4,200 c. y.	.95	3.00	3.00
4. Remove trees	50 each	10.00	10.00	10.00
5. Structure excav	1,100 c. y.	1.70	2.00	1.50
6. Stone fill	2,400 c. y.	1.50	2.00	1.20
7. Common borrow	5,200 c. y.	.40	.40	.50
8 Gravel subbase	300 c. y.	.70	.70	1.00
9. Gravel base course	14,000 c. y.	.70	.70	1.00
10. Stone base course	800 c. y.	2.00	2.00	2.00
11. Gravel surface course	700 c. y.	1.50	1.50	1.10
12. Cem. concrete pave	5,154 c. y.	10.00	10.00	11.00
13. Steel reinf., pave	278,320 lb.	.05	.045	.058

(*Additional Contract Unit Prices on second following page*)

YOUR GUIDE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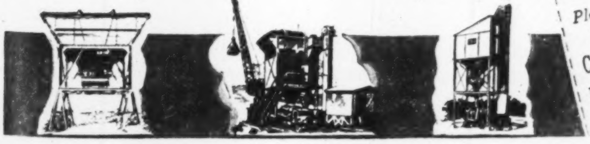

(*Contract Unit Prices continued from page 20*)

14. Concrete, cl. A	24 c. y.	18.00	20.00	18.00
15. Concrete, cl. B	102 c. y.	18.00	18.00	20.00
16. Structure reinf	2,850 lb.	.05	.05	.07
17. Cement rubble masonry	12 c. y.	15.00	10.00	15.00
18. Corr. metal pipe, 12 in	310 l. f.	1.25	1.25	1.30
19. Corr. metal pipe, 15 in	60 l. f.	1.50	1.60	1.60
20. A. C. corr. metal pipe, 24 in.	54 l. f.	3.25	3.25	3.30
21. Reinf. conc. pipe, 15 in.	128 l. f.	1.50	1.50	2.00
22. Reinf. conc. pipe, 18 in.	412 l. f.	2.00	2.00	2.50
23. Reinf. conc. pipe, 24 in.	168 l. f.	3.00	2.50	3.00
24. Underdrain, type A	1,000 l. f.	1.00	1.20	1.25
25. Wire cable guard rail	7,312 l. f.	.40	.38	.40
26. Cable guard anchorage	64 each	8.00	9.00	9.00
27. Loam	375 c. y.	1.50	1.00	1.50
28. Sodding	300 s. y.	.50	.60	.50
29. Bit. treatment	3,200 gal.	.18	.16	.20
30. Scarify old bitum. surf	1,600 s. y.	.15	.10	.07

IV — TOWN OF DORSET, VT.

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Rock excavation	200 c. y.	$0.52	$2.00	$2.00
2. Common excav., borrow	6,500 c. y.	.52	.45	.50
3. Trench excav., earth	1,300 c. y.	1.00	1.00	1.25
4. Trench excav., rock	150 c. y.	1.00	4.00	4.00
5. Patrol maintenance	7 day	15.00	10.00	10.00
6. Gravel subbase	9,000 c. y.	.63	.58	.60
7. Crushed gravel surf., M. I. P	1,425 c. y.	4.20	4.50	4.50
8. Refined tar	6,775 gal.	.14	.14	.13
9. Cutback asphalt	24,625 gal.	.13	.14	.13
10. Concrete, cl. A	60 c. y.	20.00	22.00	25.00
11. Reinf. steel	3,200 lb.	.06	.10	.06
12. Cement rubble mas	20 c. y.	10.00	9.00	10.00
13. Reinf. conc. pipe, 12 in.	564 l. f.	1.75	1.50	1.50
14. Reinf. conc. pipe, 15 in.	328 l. f.	2.10	1.90	1.75
15. Reinf. conc. pipe, 18 in.	1,092 l. f.	2.50	2.25	2.20
16. Reinf. conc. pipe, 24 in.	48 l. f.	3.70	3.50	3.25
17. Reinf. conc. pipe, 30 in.	8 l. f.	7.00	6.00	5.00
18. Corr. galv. a. c. pipe, 24 in.	12 l. f.	3.75	3.50	3.00
19. Corr. galv. a. c. pipe, 30 in.	222 l. f.	4.00	4.50	4.00
20. Wood guard rail	72 l. f.	.80	.75	1.00
21. Guide posts	15 each	2.00	2.00	2.00
22. State, F. A., markers	2 each	15.00	15.00	10.00
23. Boundary markers	50 each	4.00	3.00	4.50
24. Brick catch basins, m. h.	4 each	60.00	75.00	55.00
25. Drop inlet grates	8 each	8.00	12.00	12.00
26. Remove, reset marble walk.	280 s. y.	.50	.50	.50
27. Finish grading, seeding	500 s. y.	.10	.10	.20
28. Finish grading, sodding	1,500 s. y.	.10	.40	.20
29. Commercial fertilizer	210 lb.	.10	.25	.10
30. Grass seed	11 lb.	.10	.50	.50
31. Grass sod	1,500 s. y.	.75	.40	.50
32. Top soil	55 c. y.	1.00	1.00	1.25

SEWAGE PLANT BUILDING, BUFFALO

OWNER: Buffalo Sewer Authority; Greeley & Hansen, Engineers.

PROJECT: Construction of main building, service tunnels, sewage conduits and meters, forming part of intercepting sewer and sewage treatment project. This particular contract, Division XV, will provide for the housing of the general administration offices, laboratory, machine shop, garage, chlorination apparatus, aeration blowers, sewage metering equipment, transformers, water storage tank and miscellaneous equipment; and the furnishing of sewage meters, sewage aeration and chlorinating equipment, plumbing, heating, ventilating, piping and electrical work.

BIDS: Six bids were received in October 1937 ranging from $565,002 to $699,522. Minimum hourly wage rates are stipulated at 65c. for common labor; skilled rates range from to $1.50.

LOW BIDDERS:

1. Couse and Saunders, Detroit, Mich...........$565,002
2. F. H. McGraw & Co., New York, N. Y......... 594,795
3. John W. Cowper Co., Buffalo, N. Y........... 605,463

The following tabulation of unit bid prices omits those classifications of the construction which appear as lump sum items.

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Earth excavation	20,000 c. y.	$1.00	$1.80	$2.06
2. Rock excavation	10 c. y.	5.00	20.00	31.40
3. Selected fill material	1,000 c. y.	1.50	1.00	2.38
4. Earth embankments	1,500 c. y.	.40	.50	.64
5. Additional earth excav.	100 c. y.	2.50	3.60	3.88
6. Constr. wood sheeting	20 M.b.m.	25.00	50.00	70.00
7. Constr. steel sheeting	25,000 lb.	.025	.03	.025
8. Wood sheet piling	20 M.b.m.	85.00	60.00	110.00
9. Steel sheet piling	25,000 lb.	.055	.04	.045
10. Timber piles	12,500 l. f.	.788	.55	.65
11. Steel H piles	7,300 l. f.	2.17	2.50	2.20
12. Pile caps	10 M.b.m.	80.00	60.00	115.00
13. Plank, timber fdns	20 M.b.m.	80.00	60.00	100.00
14. Pile load tests	3 each	300.00	200.00	275.00
15. Earth load tests	3 each	200.00	250.00	110.00
16. Reinforcing steel	800,000 lb.	.0425	.055	.038
17. Reinforcing mesh	5,000 lb.	.069	.08	.08
18. Concrete, cl. A, wall, beam, slab	3,650 c. y.	21.75	21.00	18.45
19. Concrete, cl. A2, floors, footings	1,850 c. y.	13.00	14.00	11.40
20. Concrete, cl. B	100 c. y.	10.00	13.00	8.50
21. Precast concrete	25 c. y.	35.00	40.00	82.00
22. Rubbed finish	55,000 s. f.	.09	.10	.065
23. Sheet copper exp. joints	1,500 l. f.	1.10	1.50	1.45
24. Sheet mastic joints, ¾ in.	500 s. f.	.30	.50	.40
25. Painted asphalt joints	100 s. y.	1.02	.40	.70
26. Brick masonry	25 c. y.	26.00	30.00	26.00
27. Vitrified liner plates	6,000 s. f.	.32	.30	.41
28. C. I. pipe, B&S, 12 ft. lengths	150,000 lb.	.057	.05	.058
29. C. I. pipe, B&S, 3–12 ft.	20,000 lb.	.079	.085	.10
30. C. I. pipe, B&S, specials	25,000 lb.	.09	.10	.12
31. C. I. pipe, flanged, 12 ft. lengths	5,000 lb.	.068	.06	.07
32. C. I. pipe, flanged, 3–12 ft.	10,000 lb.	.09	.09	.105
33. C. I. pipe, specials, flanged.	20,000 lb.	.113	.11	.125
34. Structural steel	320,000 lb.	.0525	.055	.055
35. Misc. steel, iron	5,000 lb.	.117	.15	.13
36. Iron castings	3,000 lb.	.163	.20	.17
37. Bronze, brass, copper	500 lb.	.522	1.00	.60
38. Aluminum	500 lb.	1.17	1.20	1.17
39. Galv. floor grating	200 s. f.	2.18	2.00	1.86
40. Pipe railing	100 l. f.	2.50	2.50	2.10
41. Aeration plate containers	48 each	50.00	60.00	49.00
42. Aeration plates	480 each	2.80	3.00	3.15

CONCRETE BRIDGE, CALIF.

OWNER: State Dept. Public Works; C. H. Purcell, Engineer, Sacramento, Calif.

PROJECT: Construction of a reinforced concrete girder overhead crossing over the tracks of the Southern Pacific R.R. and Western Pacific R.R. at Greenville, Calif., consisting of one 50.5-ft. span, eight 49-ft. spans, and one 16-ft. cantilever.

BIDS: Six bids were opened in September, 1937, ranging from the contract low of $104.209 to $117.239, with minimum hourly wage rates stipulated of $1.00 for skilled and 75c. for common labor.

LOW BIDDERS:

1. A. J. Raisch, San Jose, Calif. (contract)......$104.209
2. R. R. Bishop, Long Beach, Calif.............. 108.690
3. C. N. Swenson, San Jose, Calif................ 109.196

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Structure excava	2,400 c. y.	$2.40	$1.50	$2.15
2. Reinf. steel	688,000 lb.	.052	.051	.055
3. Concrete, cl. A, struct	2,635 c. y.	21.00	23.00	22.27
4. Concrete, cl. A, railing	50 c. y.	60.00	50.00	50.00
5. Misc. steel	8,000 lb.	.12	.15	.15
6. Corr. metal pipe, 8 in	285 l. f.	1.10	1.50	1.87
7. Corr. metal pipe, 10 in	120 l. f.	1.25	2.00	2.10
8. Corr. metal pipe, 18 in	75 l. f.	2.00	3.00	2.81
9 Corr. metal pipe, 24 in	75 l. f.	3.00	5.00	3.59
10. Spillway assemblies	2 each	20.00	15.00	25.00
11. Misc. items	L.S.	2,500.00	4,400.00	2,500.00

LEVEES, SACRAMENTO RIVER

OWNER: U. S. Engineer Department, Sacramento, Calif.

PROJECT: Construction of levee along left bank of Sacramento River between Colusa Weir and Moulton Weir, with borrow from areas as designated below.

BIDS: Five bids were opened in October 1937 ranging from $10.236 to $19.592.

LOW BIDDERS:

1. C. C. Wood, Hobart Mills, Calif..................$10.236
2. Hemstreet & Bell, Marysville, Calif............. 11.394
3. Olympian Dredging Co., San Francisco, Calif... 14.213

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Embankment, Area-1a	4,900 c. y.	$0.264	$0.34	$0.41
2. Embankment, Area-2a	900 c. y.	.35	.39	.40
3. Embankment, Area-2a	26,500 c. y.	.30	.31	.39
4. Embankment, Area-3a	2,900 c. y.	.22	.38	.41
5. Water	20 M. g.	2.00	3.00	16.00

When TIME *means* MONEY *to* YOU

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Jones & Laughlin Warehouses are fully equipped for cutting, bending, forming, welding and fabricating steel to meet your exact needs. J&L Warehouses carry large and complete stocks of steel shapes and plates in a wide variety of sizes . . . there is no delay in securing the right materials for the job. Trained engineers and experienced workmen assure speed . . . accuracy . . . strength and safety . . . completely satisfactory work.

Avoid costly delays. Save time and money with high quality Jones & Laughlin Steel . . . fabricated on time to meet your needs for service and safety. Call your J & L Warehouse.

Arc-welding Diesel Engine base. (*Above*) Fabricating guide tower for driving piling at New York World's Fair.

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Operated by Jones & Laughlin Steel Service, Inc., formerly National Bridge Works

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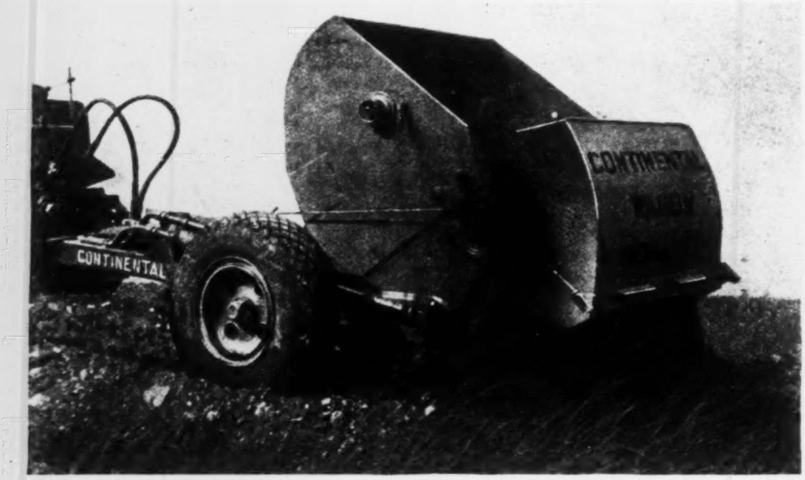
FOR EVERY NEED . . . THE RIGHT QUALITY OF STEEL IN A FULL RANGE OF SIZES

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Four-Yard Wagon Scraper

A new 4-yd. scraper designed for use with smaller 35- to 50-hp. crawler tractors has been introduced by the Tractor Equipment Division of the Continental Roll & Steel Foundry Co., of East Chicago, Ind., under the name of the "Junior Continental." It is similar in general design and operation to the larger Continental models.

A high axle clearance and a large fast-dumping rear gate are pointed out as special features of the junior model. It has the new Continental hydraulic power-control unit with adoptors for all tractors of 35 to 50 hp. The shorter overall length permits easy turning, and the cutting blade has the same width as the 5-yd. size.

• • •

Battery-Operated Flasher

The Neon flashing traffic signal which is powered by a 9-volt dry cell battery and a new type of flasher control has been introduced by the Lewis Manufacturing Co. of Decatur, Ill. The new signal consists of two separate units. The battery and flasher control are placed in a well 9 in. in diameter and 3 ft. deep which is buried in the ground near the signal. The new flasher control is said to be so effective that one battery will operate the Neon bulb 24 hours a day for four to six months.

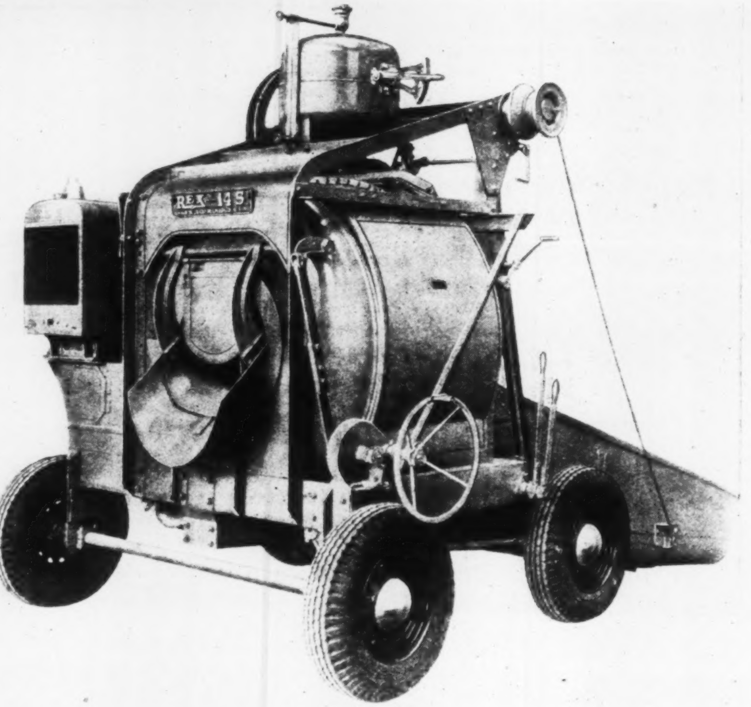
The signal unit, which need not be directly connected to the battery unit, consists of a Neon bulb mounted in a metal shell and backed by a reflector which projects the light through a 5⅝-in. red diffusing lamp.

Steam Pipe Insulation

An insulating material for underground steam pipes, known as ADSCO-Corning Filler Insulation, has been developed by the American District Steam Co. of North Tonawanda, N. Y. The insulating material is composed of fibrous glass manufactured by the Corning Glass Works and forms a soft resilient mass resembling cotton batting.

The new insulation is said to be about one-half to one-fourth the weight of other insulating materials. It fluffs under vibration instead of packing, settling or disintegrating, and it is fireproof and unaffected by water, acids or fumes. It does not compress when saturated with water, and when dried out it retains its original form without expansion.

ADSCO-Corning insulation is packed in paper bags at a density suitable for maintaining the thermal efficiency of pipe lines operating at a temperature of about 650 deg. F.; it can be supplied for higher temperatures.



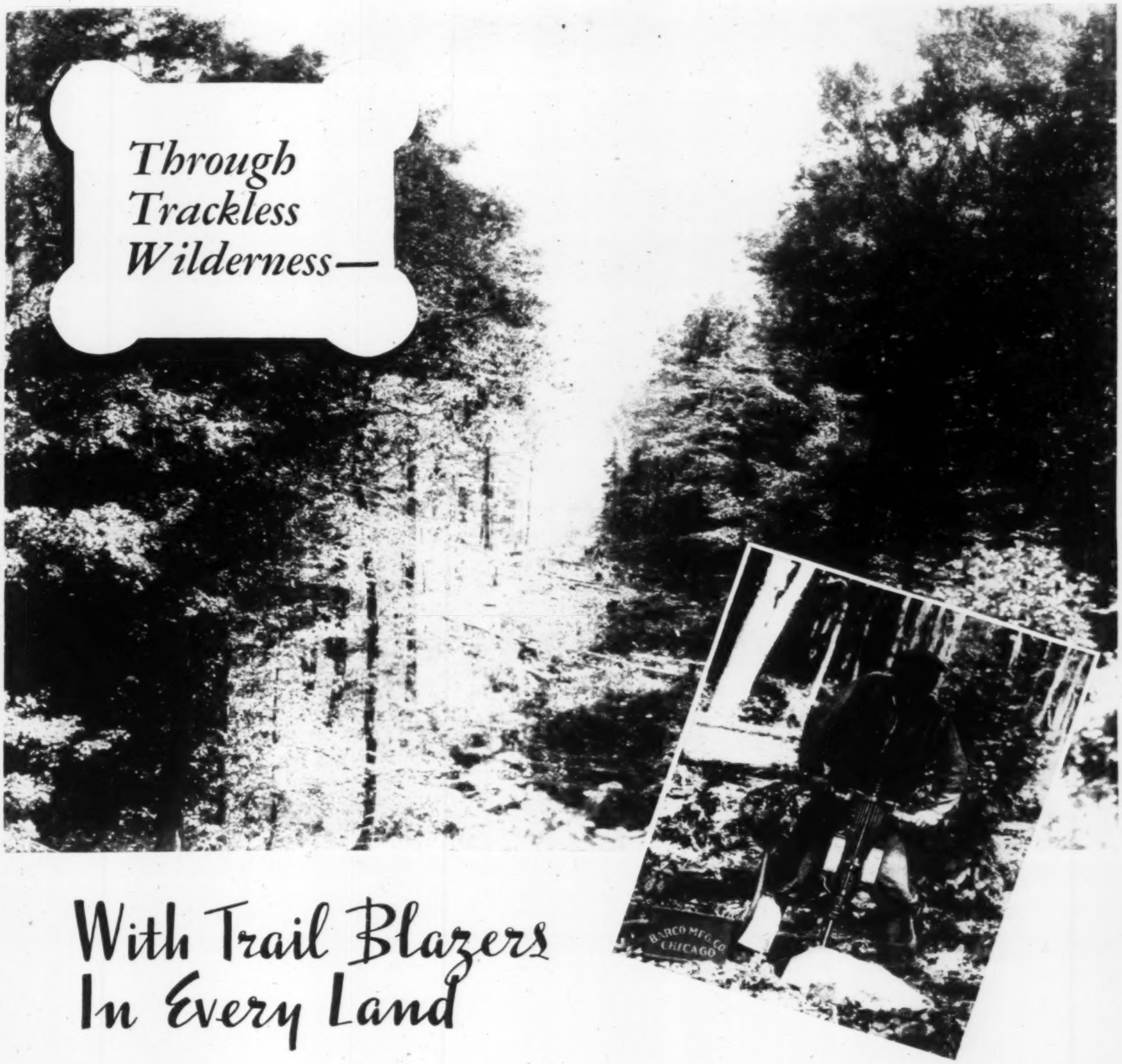
Re-designed Mixer

The new model 14-S mixer of the Chain Belt Co. of Milwaukee, is said to be a completely new machine radically different from the older model.

Faster charging and discharging has been incorporated into the new model. A streamlined Shimmy Skip gives quicker charging, and the extra large drum opening and discharge chute cleans the drum in 7 seconds.

A new water system with vertical measuring tanks and non-by-pass free way valve is said to give unusual accuracy. One-piece construction is provided in the drum by welding the drum head integrally with the center.

The mixer, mounted on a rigid steel frame, is supported from the axle by coil springs at each wheel and has automotive type steering.



With Trail Blazers In Every Land

Location is never a hazard for a Barco Portable Gasoline Hammer. Barco's accompany the world's trail blazers to the far corners of the earth. They have won their service stripes in the virgin forests of the northern country and the smoking jungles of the tropics.

The Barco illustrated here is being used to drill boulders for blasting in a location inaccessible to any other type of mechanical equipment. And, from Sumatra, Dutch East Indies, comes praise for a heavy duty Barco that has broken nearly 10,000 tons of gold ore in equally hard-to-reach territory.

Amply powered to perform any hammer job quickly . . . requiring little more space than a pick axe for transportation or storage . . . a Barco Portable Gasoline Hammer can be used wherever the operator can find a foothold and elbow room.

BARCO MANUFACTURING COMPANY
1815 Winnemac Avenue, Chicago, Ill.

BARCO *Portable* GASOLINE HAMMER

MAINTENANCE OF BRIDGE FLOORS PRACTICALLY ELIMINATED

with IRVING DECKING
THE OPEN STEEL MESH BRIDGE FLOOR

SELF-CLEANING PERMANENT STEEL DECK

During the 4½ years IRVING DECKING has been in service on the University Bridge, Seattle, maintenance costs have been practically nil—it hasn't even been repainted. Being of steel, it has the life of steel and patching and replacing is unnecessary. Being 80% open, it doesn't accumulate skid-inducing substances—such as snow, ice, oil and grease—and needs no sweeping, sanding or snow-plowing. Send for Catalog F. 200.

IRVING IRON WORKS COMPANY
LONG ISLAND CITY, NEW YORK
Originators of
IRVING SUBWAY GRATING

New Crane Valves

Two new types of globe and angle valves and a new line of screwed end globe and check valves are being offered by Crane Co. of Chicago. The iron-body globe and angle valves are recommended by the company for 160 lb. steam pressure and 300 lb. on cold water, oil or gas lines. Furnished in sizes from ¼ to 3 in., the valves have a plug type disk of nickel alloy and a body seat of heat-treated chromium iron. The valves are identified as 314-½-P globe and 316-½-P angle.

The Crane Co. is also producing a line of brass globe (14-½-P) and angle (16-½-P) brass valves. Intended for the same purposes and similar in design to the iron valves, the brass valves are made in sizes from ⅛ in. to 3 in. They resemble the former 14-P and 16-P.

Also recently added to the Crane line is a brass screwed end globe (62-P) valve of union bonnet design incorporating the new disk and seat ring, and a screwed end brass horizontal-lift check valve (78-E) with a piston-guided type disk and screwed in seat rings of nickel alloy. Both these valves are furnished in sizes from ½ to 2 in. and are intended for use on 350-lb. steam lines or on non-shock cold water, oil or gas lines up to 1,000 lb. pressure.

Bucyrus-Erie Excavator

The Bucyrus-Erie Co., South Milwaukee, Wis., has announced a new 1¼ yd. excavator, the 33-B, convertible for shovel, dragline, clamshell, crane or dragshovel service. The new excavator incorporating alloy steels and welded construction, is available in gasoline, diesel or electric power.

Special features of the 33-B include unusually long Caterpillar frames, with side frames of unit steel castings, and a welded box-girder boom. The dipper has a manganese-steel casting V-type front with sockets for inserted teeth and a curved plate door. All high speed shafts operate on ball or roller bearings.

• • •

Self-Priming Pumps

A line of portable self-priming pumps for contractors use, in sizes from 2 to 6 in., has been announced by Construction Machinery Co. of Waterloo, Ia.

Dual priming jets with a simplified recirculation control are features of these new pumps as are a three-blade trash type impeller and flanged suction and discharge connections.

A light weight model is to be introduced later.

EQUIPMENT IN BRIEF

Flex-O-Fix is a new material which comes from a tube as a plastic substance with adhesive qualities and hardens to a strong rubbery condition. It is said to have a variety of uses for repairing rubber, leather and other substances, and as packing and insulation. Waterproof and non-inflammable. Flex-O-Fix is manufactured by Frund Products Co. of Chicago.

A New Line of four-cylinder diesel engines, the "D00" series, has been introduced by Hercules Motors Corp. Developed particularly for use in smaller size commercial vehicles, the new line parallels the Hercules "00" series of gasoline engines. The "D00B" is rated at 62 hp., the "D00C" at 70 hp. and the "D00D" at 56.5 hp. The B and C are rated at 2600 r.p.m. and the "D" at 1600. The design in general follows the principles employed in the larger Hercules engines.

The Ohio Crankshaft Co. has begun construction on a new plant which will double the company's capacity. The new plant will provide 75,000 sq.ft. of floor space in a 500x150 ft. building costing $300,000. New equipment to be installed will cost $400,000. The plant will be devoted to the manufacture of crankshafts and to Tocco-hardening operations. New equipment will be installed for machining and hardening crankshafts weighing as much as 2,000 lb. Operations in the company's present plant are to be expanded to include Tocco-hardening installations.

Fenestra steel windows are rendered rust-inhibitive and their paint coat is given a longer life by a new bonderizing process recently incorporated in their manufacture by the Detroit Steel Products Co. of Detroit. The process consists of a chemical treatment of the window casements by which a non-metallic surface is formed on them, rust-inhibilting and having a greater affinity for paint than the simple metal surface.

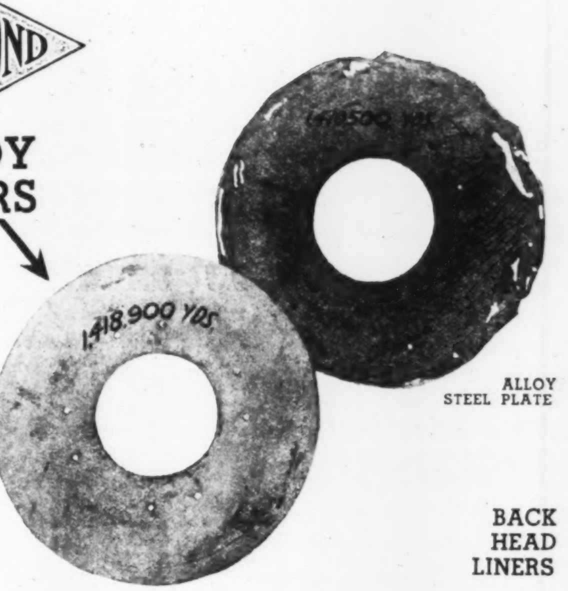
A tying device for fastening the ends of wire on wired concrete forms is being introduced into the East by Neptune Manufacturing Co. of Los Angeles. It consists of a button with a spike on one side and two lugs on the other. The spike is driven into the form, and the end of the wire to be fastened is thrust between the lugs. The button is then twisted with a wrench, the wire drawn taut, and the button fastened with a nail.

DIAMOND

ALLOY LINERS

3,676,800 YDS
PLAIN CAST STEEL
FRONT HEAD LINERS

Fort Peck dredging equipment uses single-stage centrifugal dredge pumps. The original front head liners (left) made of plain cast steel, seldom lasted for more than one and one-half million cubic yards of pumping. The one pictured shows the liner completely eaten through and the front head severely attacked after producing 1,470,500 cubic yards. The new DIAMOND alloy liners (right) have a Brinnell hardness of approximately 600, and a tensile strength of over 50,000 pounds square inch. The one pictured above (right) has produced 3,676,800 cubic yards and is still in good condition for further service.



Fort Peck dredge and booster pumps were initially equipped with alloy steel plates for back head liners (right). These were good for no more than one and one-half million cubic yards of production. The new DIAMOND alloy liners pictured above (left) were scarcely touched after producing 1,418,900 cubic yards.

Now Liner Plates on Ft. Peck Dredge Pumps *last up to 8 times longer*

—and handle millions more cubic yards

"DIAMOND alloy is a new metal used for dredge pump wearing parts and for other castings required to withstand severe abrasion and corrosion. Its record of service is outstanding. This is equally true of its record with the U. S. Engineer at Fort Peck, Montana, where the 28" dredge pump front and back head liners pictured above were used. DIAMOND alloy has outlasted other metals normally used in dredge pumps as much as eight to one. You, too, can expect exceptional life from its use. Trained engineers are available for consultation to aid you in applying DIAMOND alloy to your dredging pumps."

Pettibone Mulliken Corporation manufactures complete dredge pumps and such dredging equipment as cutters, cutter heads, flap valves and pipe fittings. Their engineers are available for your assistance in the design of complete dredges. DIAMOND dredge pumps are made in sizes from 4" up. The wearing parts are made of DIAMOND alloy or manganese steel, or the best alloy steel suited to the particular use to which the pumps are to be subjected.

STEAM RAILROAD TRACK WORK
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HEAVY MACHINE WORK
FORGINGS
DREDGING EQUIPMENT

Write for Particulars

MANGANESE STEEL CASTINGS
CARBON & ALLOY STEEL CASTINGS
HIGH TEST GREY IRON CASTINGS
ALLOYED IRON CASTINGS
DIAMOND DREDGE PUMPS

PETTIBONE MULLIKEN CORPORATION

GENERAL OFFICES & WORKS - 4710 WEST DIVISION STREET
CHICAGO

(*Continued from page 914*)

LUMBER, TIMBER, PLYWOOD—PER M FT. B.M., CARLOAD LOTS F.O.B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR — All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face) *All Fir planks No. 2 common; Fir timber is No. 1 common. Lengths up to 20 ft. (Prices in italics)*

LONG LEAF Y. P. — Merchantable grade up to 20 ft.

PLYWOOD — Rail freight increment (See note for base price)

	SHORT LEAF YELLOW PINE AND DOUGLAS FIR									LONG LEAF Y. P.		PLYWOOD	
	1x6, S4S	1x8, S4S	2x4, S4S	2x6, S4S	2x8, S4S	2x10, S4S	3x12, Rgh	6x12, Rgh	12x12, Rgh	2x12, Rgh	12x12, Rgh	⅝"	¾"
Atlanta	$15.50	$15.50	$15.00	$15.00	$15.50	$16.50	$22.00	.....	.....	$39.00	$50.00	$16.80	$20.50
Baltimore	30.00	30.00	33.00	33.00	33.00	35.00	45.00	.....	.....	68.00	68.00	16.45*f*	20.05*f*
	36.00	*36.00*	*37.00*	*35.00*	*35.00*	*35.00*	*40.00*	*$40.00*	*$38.00*	.....	.....	.....	
Birmingham	19.00	19.00	19.00	19.00	19.00	22.00	30.00	30.00	30.00	.....	.....	15.55	18.95
¹	23.00	23.00	26.00	26.00	26.00	31.00	54.00	.....	.....	48.00	53.00	.....	.....
Boston	31.00²	31.00²	35.00³	37.00³	50.00¹	60.00¹	70.00¹	.....	.....	70.00	70.00	16.45*f*	20.05*f*
	31.00	*31.00*	*35.00*	*37.00*	*37.00*	*37.00*	*45.00*	*45.00*	*45.00*	.....	.....	.....	
Chicago	28.50	28.50	30.00	30.00	30.00	38.00	40.00	.....	.....	75.00	75.00	12.45	15.15
	35.00	*35.00*	*39.00*	*39.00*	*39.00*	*44.00*		*42.00*	*42.00*				
Cincinnati	29.50	30.50	29.50	29.50	30.50	31.50	44.50	.....	.....	52.50	38.50	15.55	18.95
	.....	.....	.....	.....	.....	.....	*48.50*	*48.50*	*48.50*	.....	.....	.....	
Cleveland	30.00	31.00	37.00	30.00	39.00	40.00	52.00	*42.00*	*45.00*	52.00	65.00⁶	15.90	19.40
Dallas *e*	27.50	28.50	30.00	26.50	28.50	31.50	48.00	46.00	51.50	62.50	70.00	13.15	16.05
Denver ‡	46.00⁴	46.00⁴	50.00⁴	49.00⁴	49.00⁴	55.00⁴	54.00⁴	64.00⁴	67.50⁴	.....	.....	9.35	11.35
Detroit	24.00	24.00	24.00	24.00	24.00	24.00	35.00	.....	.....	30.00	43.00	15.55	18.95
	.....	.....	.....	.....	.....	.....	*42.00*	*42.00*	*42.00*	.....	.....	.....	.....
Kansas City	24.00	24.00	23.00	22.00	24.00	26.00	35.00	.....	.....	55.00	58.00	11.45	13.95
	28.00	*28.00*	*30.00*	*29.00*	*29.00*	*30.00*	*33.00*	*35.00*	*35.00*	.....	.....	.....	.....
Los Angeles *a*	*36.00*	*35.00*	*36.00*	*35.00*	*37.00*	*37.00*	*41.00*	*48.00*	*43.00*	.....	.....	8.90*fg*	10.80*fg*
Minneapolis ‡*b*	54.00⁶	54.00⁶	.....	.....	.....	.....	.....	.....	.....	.....	.....	11.45	13.95
‡	*45.00*	*45.00*	*48.00*	*46.00*	*46.00*	*47.00*	*65.00*	*67.00*	*67.00*	.....	.....	.....	.....
Montreal ⁷	*46.00*	*48.00*	*52.00*	50.00	54.00	69.00	84.00	.....	.....	.....	.....	.....	.....
	54.75	*54.75*	*49.25*	*60.75*	*60.75*	*64.25*	*47.00*	.....	.....	.....	.....	.....	.....
New Orleans	33.00	36.00	42.50	34.00	40.00	39.00	50.00	.....	.....	54.00	59.00	13.15	16.05
	28.90	*31.50*	*35.90*	*29.50*	*33.00*	*34.00*	*38.00*	.....	.....	.....	.....	.....	.....
New York ‡	35.00	36.00	35.00	36.50	36.50	38.00	43.00	.....	.....	80.00	82.50	16.45*f*	20.05*f*
‡	.....	.....	*43.00*	*43.00*	*43.00*	*43.00*	*40.00*	*44.00*	*44.00*	.....	.....	.....	.....
Philadelphia	22.50	24.00	23.50	24.00	25.00	26.00	28.50	.....	.....	67.00	67.00	16.45*f*	20.05*f*
	37.00	*37.00*	*32.25*	*36.00*	*37.00*	*37.00*	*37.00*	*43.50*	*43.50*	.....	.....	.....	.....
Pittsburgh	38.10	39.90	47.05	42.00	45.65	46.90	59.70	.....	.....	.....	.....	16.20	19.70
	51.90	*49.60*	*49.60*	*49.00*	*48.90*	*49.25*	*66.55*	*66.55*	*66.55*	.....	.....	.....	.....
St. Louis ‡*c*	28.00	29.00	28.00	27.00	28.00	29.00	47.00	*54.00*	*54.00*	73.00	72.00	13.15	16.05
San Francisco *d*	*20.00*	*20.00*	*20.00*	*20.00*	*20.00*	*20.00*	*24.00*	*24.00*	*24.00*	.....	.....	6.95*f*	8.50*f*
Seattle	*22.50*	*23.50*	*23.50*	*22.50*	*22.50*	*22.50*	*26.00*	*26.00*	*26.00*	.....	.....	0.00	0.00

Bold Face type, Southern Pine. *Italics, Douglas Fir.* ¹ Long leaf. ² Roofers' N.C. Pine. ³ Spruce. ⁴ Native. ⁶ Western Pine, No. 3 Common. ⁷ Pine. ⁸ Norway Pine. ‡ Delivered. *a* Yard prices. *b* Contractors in Minneapolis and St. Paul get 10% discount from list. *c* 5M ft. or less. *d* At ship's tackle. *e* 10% discount taken off.

Note: Special concrete form grade Fir Plywood, 4′ by 8′ panels, 5-ply, sanded 2 sides, water resistant glue, car load lots, delivered per 1000 sq. ft. surface. Base price — Seattle: ⅝", $59.50; ¾", $67.90. For other centers add rail freight increment from table for proper size. Add: for form oil treatment, $2.50 per M. sq. ft.; for mineral paint sealed edges, $1.00 per M; for resin dipped treatment, $10.00 per M. *f* Lower rate by water shipment. *g* 50,000 lb. minimum.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS — Discounts from latest jobbers list, Sept. 15, 1928 Single or Double Thickness A quality	WINDOW GLASS — B quality	EXPLOSIVES — Per lb. 40% Ammonia Gelatin in 50-lb. cases delivered in 200 lb. lots*
Atlanta	85%	87%	$0.16
Baltimore	88%	87%	.16
Birmingham	87%	89%	.115
Boston	87%	89%	.16*d*
Chicago	86%	87%	.16
Cincinnati	89–10%	91–10%	.16
Cleveland	85–10%	85–10%	.20
Dallas	80%	80%	.175
Denver	85%	86%	.16*e*
Detroit	87–10%	89–10%	.16
Kansas City	86–10%	87–10%	.165
Los Angeles	90%*a*	90@40%	.1675
Minneapolis	84–10%	85–10%	.165
Montreal	60–30%	70–5%	.18†
New Orleans	88%*b* 85%*c*	86%*b* 80%*c*	.17
New York	89%	90%	.23*f*
Philadelphia	88%	89%	.16
Pittsburgh	86%	87%	.1525
St. Louis	86%	87%	.165
San Francisco	78%	83%	.165
Seattle	83%	86%	.1675

Price of 60% Ammonia Gelatin is $0.015 per lb. higher than 40%

a Disc. from list Aug. 1, 1929. *b* Single thickness. *c* Double.

* Urban prices influenced by service charges or local storage and delivery regulations, do not consistently reflect quantity prices in less congested areas. *d* Delivery charge of $4.00 for lots of 300 lb. or less. *e* F.o.b. Louviers, Colo. *f* In boroughs of Kings, Queens and Richmond, and in Manhattan south of Canal Street, add delivery charge of $6.00 per trip. †F.o.b.

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla.	$0.115	$0.14	$0.16
W. of Miss., to Rocky Mtm. States, and Fla.	.12 –.13	.145 –.16	.165 –.18
Rocky Mtm. States	.12 –.1425	.14 –.155**	.16 –.175**
Pacific N. W. States	.1175–.13	.1475–.16	.1675–.18
Pacific S. W. States	.1150–.1275	.145 –.1525	.165 –.1725

** F.o.b. Louviers, Colo., or Butte, Mont.

PILES, TIES—F.O.B.

PILES

Prices per linear foot, pine, with bark on, f.o.b. New York; delivered from barge 1½ to 2c. per ft. additional:

Dimensions	Points	Length	Short Leaf — Barge	Short Leaf — Rail
12 in. at butt	6 in.	30 to 50 ft.	$0.18	$0.195
12 in.—2 ft. from butt.	6 in.	50 to 59 ft.	.225	.24
12 in.—2 ft. from butt.	6 in.	60 to 69 ft.	.23	.255
14 in.—2 ft. from butt.	6 in.	50 to 69 ft.	.24	.265
14 in.—2 ft. from butt.	6 in.	70 to 79 ft.	.265	.275
14 in.—2 ft. from butt.	5 in.	80 to 85 ft.	.38	.415
14 in.—2 ft. from butt.	5 in.	85 to 89 ft.	.42	.482

RAILWAY TIES

Prices f.o.b., per tie, for carload lots:

		6" x 8" x 8′ Untr.	6" x 8" x 8′ Tr.	7" x 9" x 8′ 6" Untr.	7" x 9" x 8′ 6" Tr.
Boston	Oak	$1.20	....	$1.75	....
	Pine	1.20	$1.70*a*	1.80	$2.60*a*
New York	S.L. Sap Pine	1.00/1.10	1.80*g*	1.25	2.25*g*
	Mixed Oak	1.45	....	1.75	....
Birmingham	White Oak	.85	1.50*a*	1.35	1.70*a*
	Southern Pine	.55*b*	1.10*ab*	.70	1.30*a*
Chicago	Oak	....	1.67*ac*	....	2.05*a*
	Oak	....	1.55*d*	....	1.90*d*
	Southern Pine	....	1.50*a*	....	1.95*a*
Los Angeles	Douglas Fir	.64	1.38*a*	.90	1.80*a*
Philadelphia	Red Oak	1.25	....	....	2.60*a*
St. Louis	White Oak	1.25	....	1.60	....
	Red Oak	1.20	1.60*a*	1.50	2.00*a*
	Sap Pine or Cypress	1.05	....	1.35	....
San Francisco	Douglas Fir	.80*bef*	....	....	1.85*ef*
Montreal	Birch or Maple	.70	1.10*a*	.80	1.40*a*

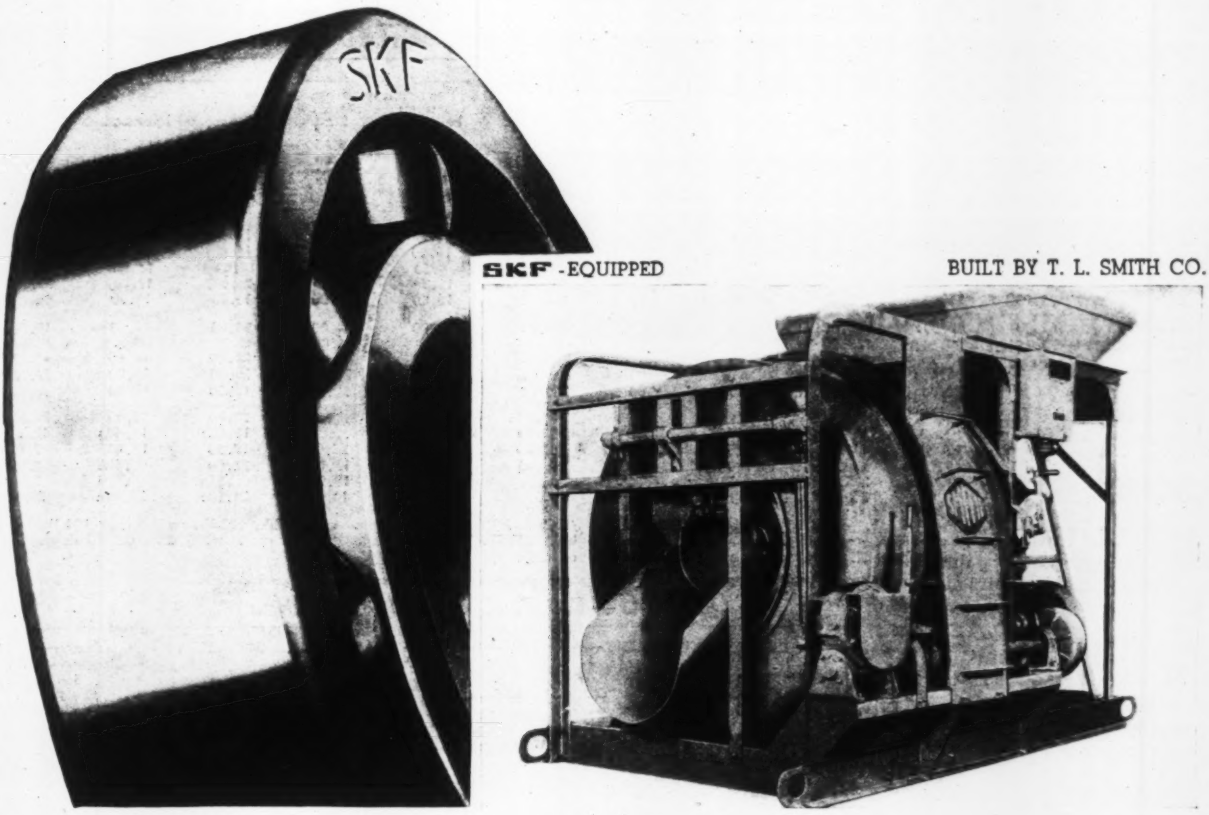
Tr.—Treated; Untr.—Untreated. *a* Creosoted. *b* 6" x 8" x 8′ 6" *c* Empty cell. *d* Zinc. *e* Green. *f* At ships tackle. *g* Dense pine

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder, in drums, f.o.b. works, per 100-lb	$2.00-2.85
Chlorine cylinders, per lb. delivered	.055
Calcium chloride, 77–80%, flaked, in 400-lb. drums or 100-lb. moisture proof bags, f.o.b works, freight equalized with points of competition, per ton	22.00-35.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	1.25
Soda ash, 58%, in paper bags, per 100 lb. dense	1.10
Sulphate of aluminum, commercial, in 100-lb. bags, per ton	27.00
Sulphate of copper, in bbl., per 100-lb	4.75-5.50

(*Continued on page 30*)



SKF-EQUIPPED BUILT BY T. L. SMITH CO.

GOOD MIXERS NEED GOOD BEARINGS

to insure profits from maximum production

● One man can easily control charging, discharging and water on this Smith 28-S Non-Tilt Mixer. For levers are centralized on the countershaft, and SKF Bearings are used to keep the counter and gear shafts in correct position.

Carefree and dependable, SKF's never need adjustments to maintain their initial close tolerances. This is proved by the way in which they help this machine produce up to 28 cubic feet of mixed concrete plus 10%. Taking radial and thrust loads in any combination in either direction, the only attention they require is infrequent lubrication. You, too, can make a good mixer better by selecting SKF's.

3990

SKF INDUSTRIES, INC., FRONT ST. & ERIE AVE., PHILA., PA.

MORE THAN
1200
TYPES AND SIZES

Industry comes to SKF for unbiased bearing counsel because SKF makes practically all types of anti-friction bearings.

SKF
BALL AND ROLLER BEARINGS

(Continued from page 28)

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE—PARTITION—SCORED Per M, lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE—LOAD BEARING—SCORED Per M, lots of 2,000 pieces or over,			BRICK Per M, in quantity,		LIME		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Per ton, Hydrated finishing	in paper, Common hydrated	carload lot, Pulverized or lump
Atlanta	$63.20	$67.40	$126.30	$126.30	$147.40	$168.40	$10.40	$15.15	$19.50	$13.50	$13.50
Baltimore	93.00	100.00	185.00	225.00	320.00	395.00	13.00	17.00	20.00	15.00	25.00
Birmingham	78.75	84.00	157.50	189.00	201.25	242.00	15.00	19.00	3.00*o*	1.75*o*	2.25*lo*
Boston	86.25*ab*	92.00*ab*	172.50*ab*	195.90*ab*	211.65*ab*	242.00*a*	16.00*i*	19.00*i*	19.00	15.00	3.50*lp*
Chicago	66.00	70.50	132.00	180.00	228.00	260.00	11.00	12.00	15.50	14.00	12.00
Cincinnati	56.45	60.40	115.25	138.70	166.50	206.40	17.50	17.50	15.90	13.00	.....
Cleveland	52.50	56.00	105.00	126.00	170.00	194.50	16.50	16.50	16.80*j*	14.40*j*	2.65*jm*
Dallas	59.00	62.00	125.00	149.00	155.00	177.00	9.50	24.00	19.00	16.00	.95*n*
Denver	78.50	88.00	141.50	166.50	196.00	225.50	12.00	15.50	25.00*j*	17.00*j*	25.00*j*
Detroit	71.85	76.65	143.70	230.00	280.00	325.00	16.00	17.00	19.00	16.00	16.00
Kansas City	64.50	66.50	81.00*c*	125.50	159.75	186.25	14.00	24.00	18.90	12.60	10.50
Los Angeles	73.50†*r*	89.50†*r*	128.00*c*†*r*	210.00†*r*	368.00†*r*	460.00†*r*	12.00	14.00	18.70	.....	19.70
Minneapolis	80.35	85.70	146.00	192.85	176.20*d*	245.20*d*	13.10	15.10*g*	21.00	16.00	19.00
Montreal	84.00*a*	96.00*a*	180.00*a*	......	273.00	......	15.50†	20.75†	23.50	17.00	11.00
New Orleans	72.00	72.00	135.00	162.00	180.00	220.00	14.00	.....	18.30	12.60	.....
New York	87.00	93.00	128.00*c*	193.30*h*	238.80*h*	295.60*h*	12.50	.....	20.00	15.50	20.00
Philadelphia	80.50	85.90	161.10	193.30	238.80	295.60	.....	.....	16.10*q*	11.40*q*	10.90*q*
Pittsburgh	58.40	62.30	116.85	175.35	229.90	262.75	17.50	25.00	17.50	15.00	2.40*m*
St. Louis	62.00	65.00	120.00	180.00	234.00	280.00	16.00	17.00	22.00	.40*k*	2.25*lm*
San Francisco	84.00	94.50	225.00	......	......	......	14.00	17.00	.55*o*	.40*o*	2.05*m*
Seattle	90.00	100.00	200.00	......	......	......	18.00*f*	18.00*f*	20.00*s*	20.00*s*	20.00*s*

a Smooth. *b* Carload lots delivered to job. *c* 6 x 12 x 12 in. *d* Not load bearing. *e* 8 x 8 x 8 in. only. *f* Less $1.00, ½ cash 15 days, balance 30 days. *g* Selected common. *h* F.o.b. Perth Amboy, N. J. *i* 50c per M off for cash. *j* LCL. *k* Per sack. *l* Lump. *m* Per bbl., 180 lb. *n* Per sack 100 lb. *o* Per bbl., 200 lb. *p* 280 lb. bag. *q* 15-ton cars. *r* 5% discount 10 days. *s* 2% off cash. † F.o.b.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

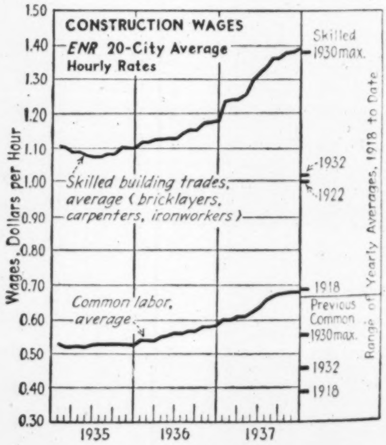
	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in oil	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES Carload lots f. o. b. factory				
			Graphite *b*	Aluminum *c*	Ferric Oxide *d*	Rolls, slate surfaced, 85-90 lb., per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch, 350 lb. bbl., per ton
Atlanta	$9.00	$11.875	$1.62	$3.17	$1.40	$2.00*l*	$2.00*l*	$2.36*l*	$.36*l*	$28.00
Baltimore	8.75	11.50	1.45	2.25	1.70	2.16	2.75	2.75	.40	27.50
Birmingham	9.00	11.875	2.35	2.35	1.85	2.17	2.25	2.25	.45	30.37
Boston	8.75	11.50	2.00‡	2.30‡	2.11‡	1.96‡	2.25*h*‡	2.14*h*‡	.45‡	20.00‡
Chicago	8.75	11.50	1.80	....	....	2.47	2.37	2.37	.43	33.00
Cincinnati	8.75	11.50	1.45	2.50	1.40	2.40	2.39*h*	2.39*h*	.36	21.00
Cleveland	8.75	11.50	1.90	2.60	1.40	2.10	2.04*h*	2.04*h*	.305	27.50
Dallas	9.00	12.25	1.80	2.10	....	2.75*h*	2.50*h*	2.50*h*	.60	60.00
Denver	9.25	12.00	....	....	....	2.45	4.00	3.00	.35	28.00
Detroit	8.75	11.50	1.90	2.50	1.50	2.30	3.15	3.00	.35	30.00
Kansas City	8.75	11.625	2.15*g*	2.40*g*	1.67*g*	1.93	2.09	2.09	.25	25.00
Los Angeles	9.00	11.75	1.60	2.25	2.30	2.10	1.50	....	.45	.....
Minneapolis	8.75	11.625	....	....	....	1.85*i*	1.78*hi*	1.78*hi*	.29	23.80
Montreal	.....	8.20	2.00*f*	4.75*f*	2.40*f*	2.50	1.60	1.83	.60	1.55*j*
New York	8.75	11.50	1.90	2.60	1.65	1.65	1.80*h*	1.80*h*	.033*e*	24.00
Philadelphia	8.75	11.50	2.515	2.94	1.515	1.95	2.86*h*	2.86*h*	.29	26.00
Pittsburgh	8.75	11.50	1.05	1.95	.80	1.95	1.94*h*	1.94*h*	.34	26.00
St. Louis	8.75	11.50	1.70/1.90	2.50/2.75	1.50/1.90	1.90/2.00*h*	2.70/2.80	2.70/2.80	.25/.35	28.00/30.00
San Francisco	9.00	11.50	1.80	2.75	1.10–2.00	1.80	2.62	2.62	.36	18.00
Seattle	9.00	11.75	1.80	2.85	2.20	1.98	2.42	2.60	.73	28.00*k*

‡ Delivered. Note: Red lead in oil 50c. higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3-49A. *c* ASTM Spec. D266–31. *d* 80% maximum ferric oxide. *e* Per lb. *f* Sales tax extra. *g* 5 gal. cans. *h* Per roll, 65 lb. *i* Minneapolis and vicinity. *j* Per 100 lb. *k* Asphalt pitch. *l* Downward revision in Mid-December, not yet definite.

SKILLED AND COMMON WAGE RATES—PER HOUR

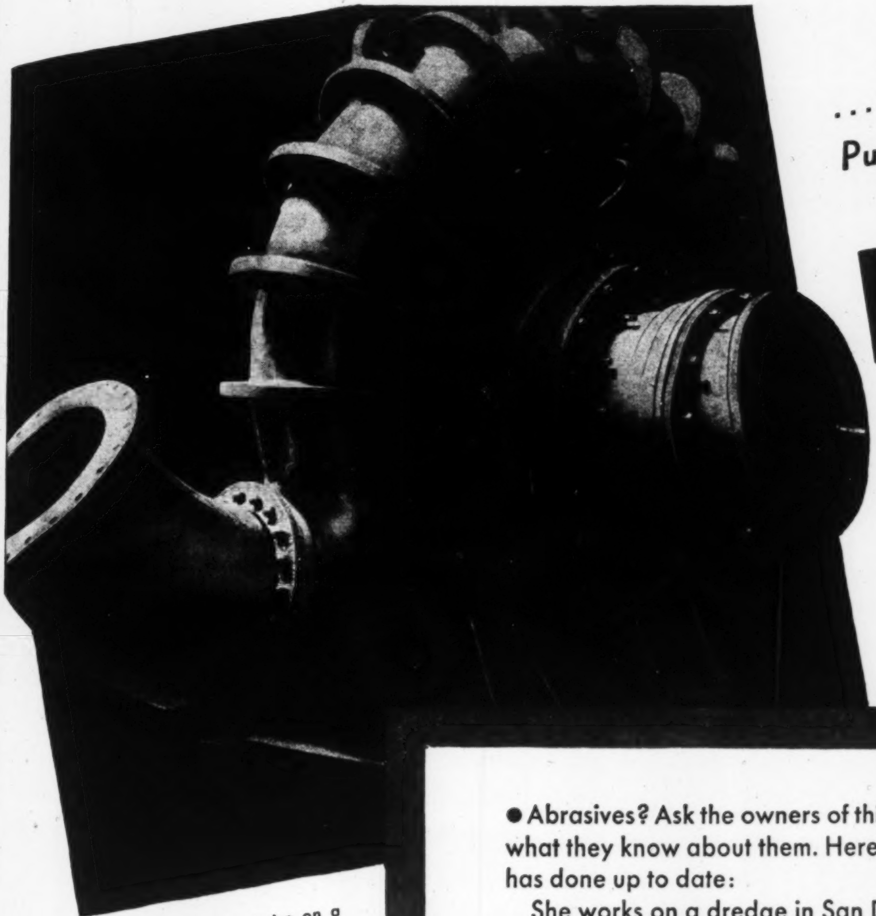
	Bricklayers	Carpenters	Struct. Iron Workers	Hoisting Engineers	Plasterers	Common Labor Building	Common Labor Heavy Const.
Atlanta	$1.25	$1.00	$1.25	$1.00/1.25	$1.25	$0.40/.50	$0.40/.50
Baltimore	1.50	1.25	1.50	1.50	1.25	.50	.50
Birmingham	1.50	1.125	1.25	1.125	1.00	.30/.40*a*	.30/.40*a*
Boston	1.50	.90/1.375	1.375	1.00/1.375	1.625	.60/.85	.60/.85
Chicago	1.70	1.625	1.70	1.625	1.70	1.025	1.025
Cincinnati	1.00/1.625	.70/1.35	1.40	1.00/1.40	1.00/1.625	.60/.75	.60/.75
Cleveland	1.625	1.375	1.50	1.50	1.50	.90	.90
Dallas	1.25	1.00	1.00	1.00	1.25	.40	.40
Denver	1.50*b*	1.50*b*	1.43*b*	....	1.43*b*	.714*b*	.714*b*
Detroit	1.50	1.25	1.50	1.50	1.55	.75/.80	.75/.80
Kansas City	1.50	1.375	1.50	1.50	1.575	.85	.45/.50
Los Angeles	1.10	1.10	1.125	1.25	1.25	.625	.625
Minneapolis	1.375	1.25*d*	1.50	1.40	1.50*e*	.85	.85
New Orleans	1.00	.75/1.00	1.00/1.25	1.00	1.00	.30/.40	.30/.40
New York	1.886*b*	1.75*b*	1.925	2.00*b*	2.00*c*	.95	.875/.95
Philadelphia	1.50	1.00	1.375	1.50	1.375	.40/.50	.40/.50
Pittsburgh	1.75	1.50	1.50	1.25	1.75	.80	.70
St. Louis	1.50	1.25	1.75	1.57/1.75	1.58	.875	.45/.875
San Francisco	1.75*c*	1.50	1.50	1.50	1.65*c*	.75	.65
Seattle	1.60*c*	1.25*c*	1.50*c*	1.50*c*	1.60*c*	.90*c*	1.00*c*
Montreal	.80	.70	.75	.70	.80	.40	.35

a PWA *b* 7 hr. day. *c* 6 hr. day. *d* 35 hr. wk. *e* 30 hr. wk.



ENR Skilled Average: (Bricklayers, Carpenters, Iron workers) $1.391
ENR Common Average: $0.678.

Abrasives may scrape but you save



... when your Pump Casing is made of

NICKEL CAST IRON

● Pump casing in service on a dredge in harbor of San Diego, Calif. Its makers, Golden State and Miners Iron Works Co., of San Francisco, added 1.50 to 2% Nickel and 0.50% chromium to increase strength and resistance to wear and abrasion.

● Abrasives? Ask the owners of this big pump casing what they know about them. Here's what this casing has done up to date:

She works on a dredge in San Diego harbor. She has handled 3,200,000 cubic yards of material... and her owners estimate she is good for at least 1,000,000 more. And look at what's in that material:

It averages 5% rock, 20% gravel, and 10% silt. Do you wonder that in this casing's lifetime the owners have worn through 4 steel runners... so far?

Golden State and Miners Iron Works Co., makers of the casing, have found the sure way to make it stand the scrape of harsh abrasives. They use an alloy cast iron containing 1.50 to 2.00% Nickel, with about 0.50% chromium.

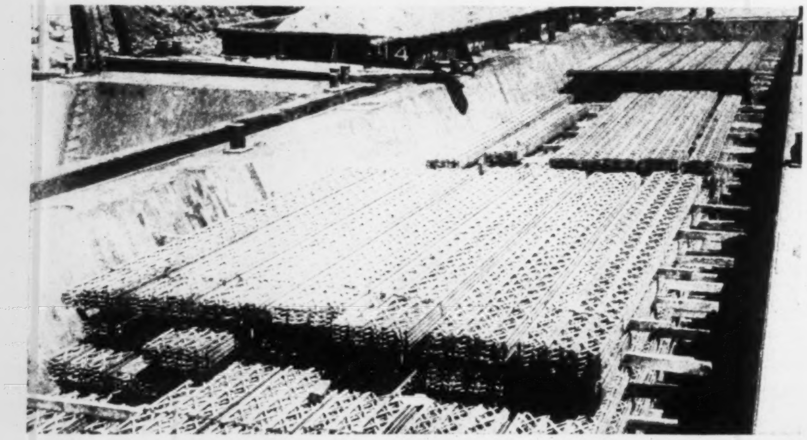
The modern foundry has learned that small amounts of Nickel give the dense uniform grain structure which means resistance to stress, and abrasion, which greatly improve casting properties as well.

The experience of the Inco engineers reaches into many fields. Consultation on your casting problems is invited.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL STREET, NEW YORK, N. Y.

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news

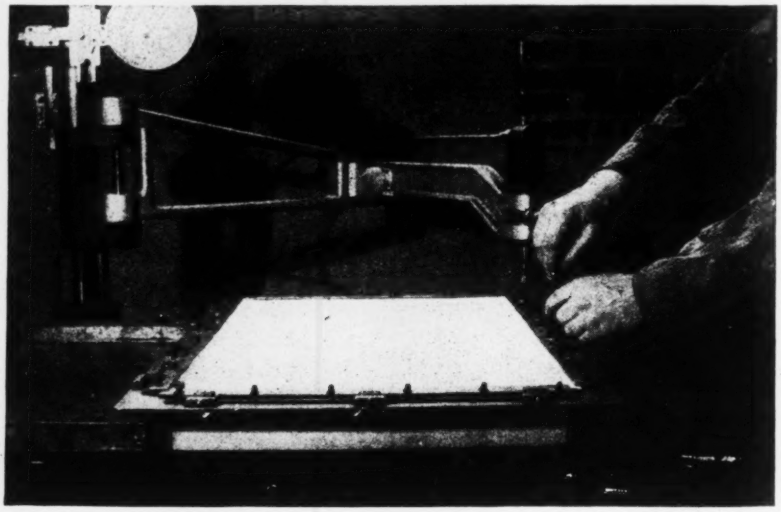


Reinforcing Steel Section

A new concrete reinforcing section, known as Jaltruss, recently placed on the market by Jones & Laughlin Steel Corp., Pittsburgh, is intended for reinforcing concrete slabs in the floors of bridges and other large structures in which the floors are subjected to heavy moving loads. It is a hot rolled section in the shape of a double Warren truss, rolled of specially selected structural steel.

Jaltruss is available in ten sizes.

Longmire
Packwood
Packwood
2000
3000
4000
5000



Relief Map Process

A company has been organized in Washington. D. C., known as Third Dimension Maps, Inc., to produce relief maps and pictorial copies in quantities, using a new method and machines recently patented by John J. Braund, cartographer in the Coast and Geodetic Survey. The company states that they are able to produce relief maps at about a fifth of the cost and about sixteen times as fast as by previous methods. With this method, instead of building up the map in lifts and applying lettering by pasting paper to the finished map, the maps are made by bending a semi-soft aluminum sheet.

The map is printed on both sides of the aluminum sheet. The sheet is then locked in a new machine known as a "reliefograph". A rubber base is beneath the sheet at the level of the lowest contour. This contour line is then driven down to the rubber base by means of a rubber-headed punch, the stroke of which is controlled by a special device. The base is then lowered one elevation, the stroke of the punch is changed, and the second elevation is depressed. The process is continued until the map is finished, with all markings in place.

Three dimensional duplicates are made by a special hydraulic press, or maps with a relief effect may be obtained by photographing the model under a slanting light.

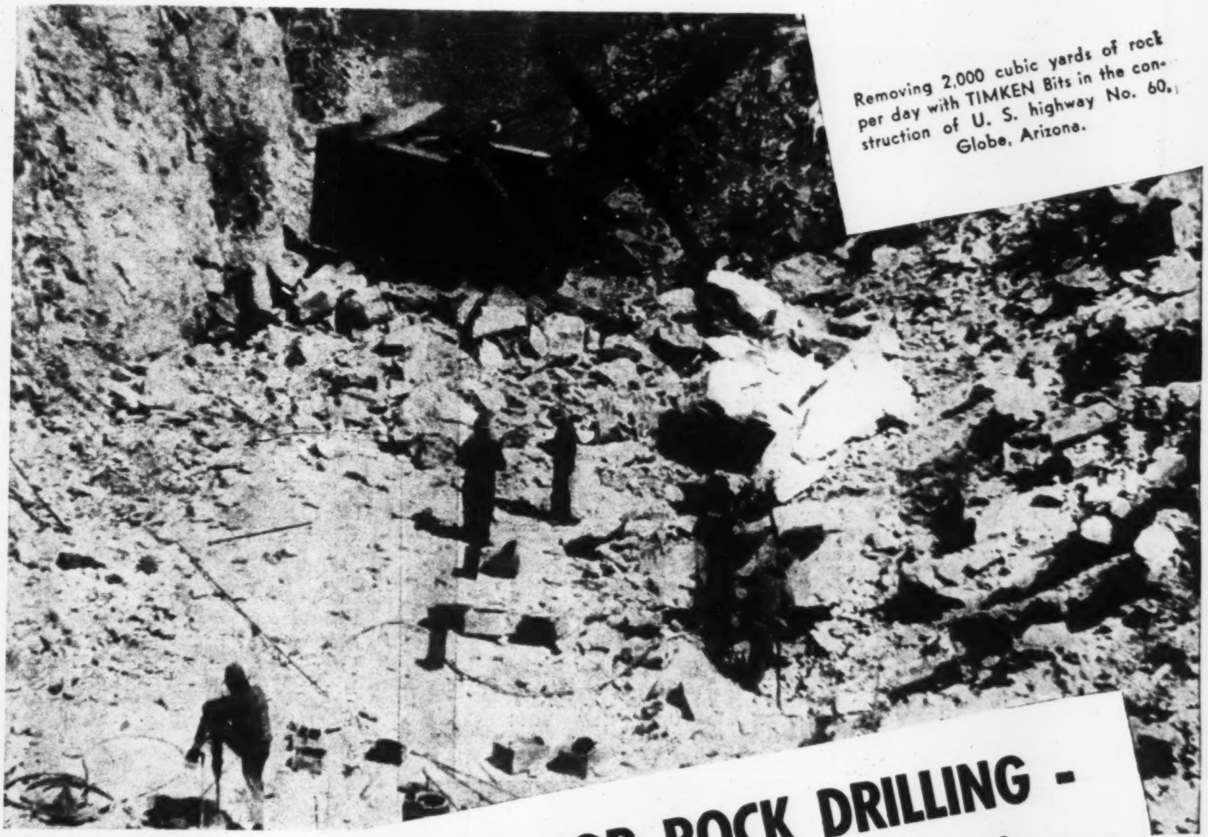
• • •

Anti-Corrosion Coating

A plastic material which can be sprayed on with ordinary paint spraying equipment is intended for the protection of concrete, steel and wooden structures against corrosion and electrolysis. It is known as "Amercoat." It is manufactured by the American Concrete, & Steel Pipe Co., Los Angeles, Calif. Applied to a thickness of 1/64 in., Amercoat is said to be unaffected by 20 per cent solutions of sulphuric, hydrochloric and other acids, by caustics of all types, by gasoline, oils, and many other corrosive agencies. It is also a non-conductor of electric current and, in marine application, repels barnacle-type growths.

Although not designed to resist abrasion, Amercoat has abrasion-resistant properties comparable to those of rubber and Bakelite. It forms a strong bond to concrete, steel, and wood, and, the manufacturers state, cannot be peeled or readily chipped off.

The coating is applied in three quick-drying solutions.



Removing 2,000 cubic yards of rock per day with TIMKEN Bits in the construction of U. S. highway No. 60, Globe, Arizona.

THE MODERN TOOL FOR ROCK DRILLING -

Saves Time and Money

The Rock Island "Rockets" Roll On TIMKEN Bearings

GLIDE—as you ride a Timken-equipped train

Rock removal is a major operation on many construction jobs. The more rock drilling you have to do the more profitable you will find TIMKEN Rock Bits.

A greater number of holes can be drilled in a given time—straighter, cleaner holes—with TIMKEN Bits than with the best forged steels you have ever used under similar conditions.

Your drillers will have less steel to handle because of the removable feature of the TIMKEN Bit. The streamlined design of the TIMKEN Bit makes it drill faster. And TIMKEN Alloy Steel makes TIMKEN Bits last much longer than forged steels in any kind of drilling.

TIMKEN Rock Bits have been used on some of the country's largest construction projects with substantial savings of time and money. You will find them equally economical on the average every-day job.

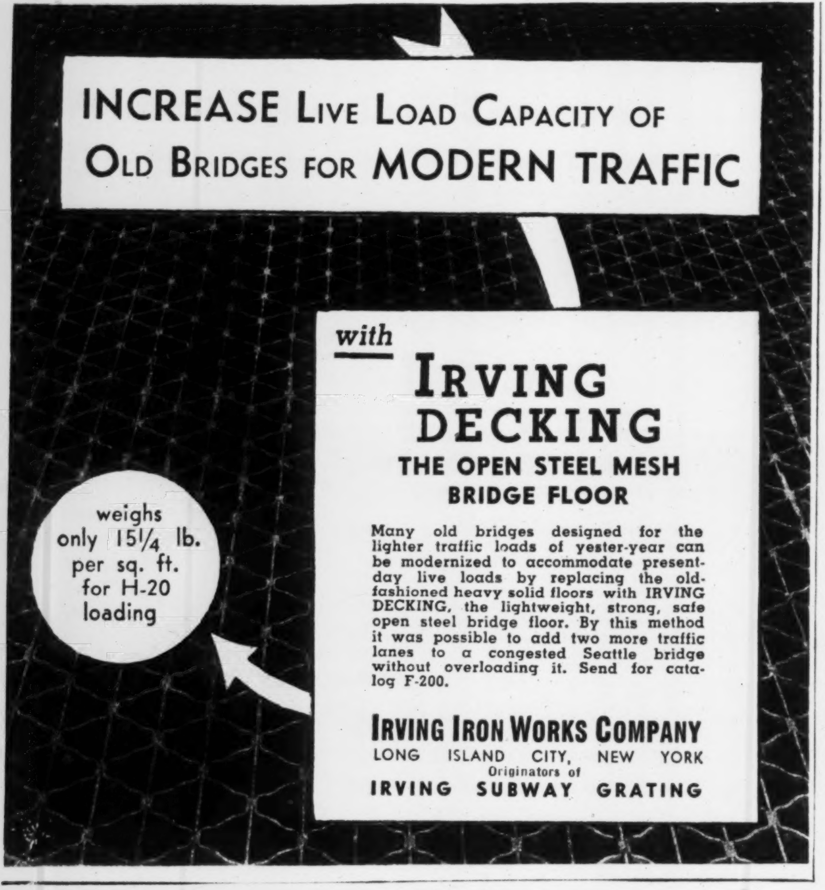
Write for a copy of the latest Timken Rock Bit booklet with name and address of nearest distributor.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

TIMKEN

ROCK BITS


INCREASE Live Load Capacity of Old Bridges for MODERN TRAFFIC

with

IRVING DECKING

THE OPEN STEEL MESH BRIDGE FLOOR

weighs only $15\frac{1}{4}$ lb. per sq. ft. for H-20 loading

Many old bridges designed for the lighter traffic loads of yester-year can be modernized to accommodate present-day live loads by replacing the old-fashioned heavy solid floors with IRVING DECKING, the lightweight, strong, safe open steel bridge floor. By this method it was possible to add two more traffic lanes to a congested Seattle bridge without overloading it. Send for catalog F-200.

IRVING IRON WORKS COMPANY
LONG ISLAND CITY, NEW YORK
Originators of
IRVING SUBWAY GRATING

NEW PUBLICATIONS

Two New Pamphlets discuss the engineering uses of calcium chloride. Bulletin No. 35, "Better Concrete Curing, High Early Strength and Cold Weather Concreting," outlines advantages of calcium chloride curing in cold weather concreting. A.S.T.M. Specifications are included. Bulletin No. 36 discusses "Ice Control and Skid-proofing Icy Pavements."—Calcium Chloride Association, Detroit, Mich.

A Handsome and substantially bound catalog describes the uses and manufacturing of asbestos and magnesia products.—Keasbey & Mattison Co., Ambler, Pa.

The Hobart Pipe Thawing Manual, after a brief discussion of the advantages of the Hobart welder for pipe thawing work, devotes most of its 22 mimeographed pages to practical hints and suggested hookups for this type of operation.—Hobart Bros., Troy, Ohio.

The Much Talked Of pre-fabricated house gets a pictorial workout in a booklet entitled "Pre-Fab in Pictures," which illustrates the manufacturing processes of the Pre-Fab house and shows structural, architectural and erection details.—Harnischfeger Corp., Housing Division, Milwaukee, Wis.

Bethlehem open web steel joists are described, pictured and tabulated in a 32-page pamphlet.—Bethlehem Steel Co., Bethlehem, Pa.

Two new bulletins, T-13 and T-14, describe the use of nickel and nickel-base alloys in the design of corrosion-resistant machinery and equipment. T-13 discusses the properties of these alloys and T-14 is specifically devoted to the design and construction of heavy equipment.—Development and Research Division, The International Nickel Co., Inc., New York City

Transite pressure pipe and its manufacture are described in text and a considerable number of job photos in a new 32-page bulletin. Also included are data on pumping costs and friction losses.—Johns-Manville, New York City.

The History of corrugated metal drainage pipe from its invention in 1896 to the present day is outlined in a folder, "Your Guide to Better Drainage,"—Armco Culvert Manufacturers Association, Middletown, Ohio.

A Circular calculator 6 in. in diameter performs mechanically a number of the computations involved in chemical treatment of water.—Industrial Chemical Sales Division of West Virginia Pulp & Paper Co., New York City.

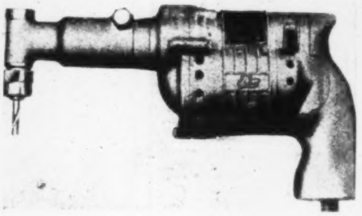
Littleford Bulletin M-11 describes concrete and water heaters and heating torches for winter construction work.—Littleford Bros., Cincinnati, Ohio.

A Catalog of safety clothing for industrial use describes Steel-Grip Apparel.—Industrial Glove Co., Danville Ill.

An Account of the uses which have been made of nickel alloy steel in hand tools is given in a new bulletin, U-3.—The International Nickel Co., Inc., New York City.

"Low Cost Snow Removal" is the title of a new bulletin describing Barber-Greene snow loaders.—Barber-Greene Co., Aurora, Ill.

The Entire Line of Brown potentiometer pyrometers, indicating, recording and controlling, is described in a new catalog, No. 1102.—The Brown Instrument Co., Philadelphia.



Right Angle Drill

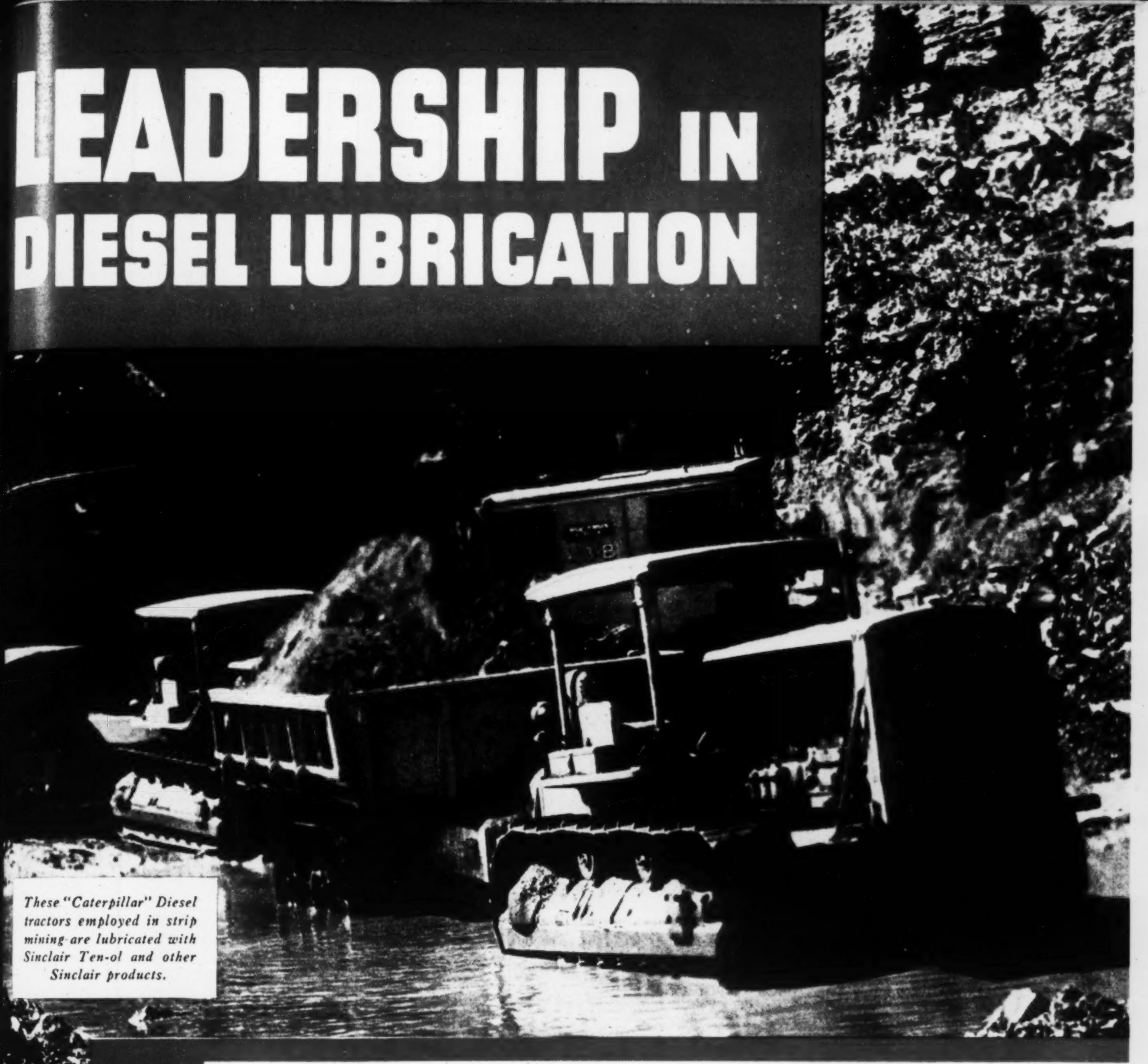
The new Thom U14R 3/16-in. capacity right angle portable electric drill requires a working clearance of only $2\frac{3}{8}$ in. The drill head measures $2\frac{1}{8}$ in. overall, and the angle attachment can be turned and clamped into any position.

Manufactured by the Independent Pneumatic Tool Co. of Aurora, Ill., the new drill weighs 3 lb. and has an extreme dimension of $9\frac{1}{4}$ in. Its drilling range is from 1/16 in. to 3/16 in. Regularly operating at a speed of 2,700 r.p.m., it can also be furnished at speeds of 3,750 r.p.m. and 5,100 r.p.m.

• • •

New Small Drill

A description in the November 4 issue, Page 4, of a new $\frac{3}{16}$-in. electric drill designed with the chuck spindle mounted at right angles to the motor for working in inaccessible places, failed to state that the drill is manufactured by The Black & Decker Mfg. Co. of Towson, Md.



LEADERSHIP IN DIESEL LUBRICATION

These "Caterpillar" Diesel tractors employed in strip mining are lubricated with Sinclair Ten-ol and other Sinclair products.

SINCLAIR TENOL

REG. U. S. PAT. OFF.

Less than a year ago Sinclair introduced Ten-ol, a lubricant as rugged in service performance as the "Caterpillar" Diesel engines for which it was developed.

Wide acceptance put Ten-ol to the most convincing of tests—showdown of performance under the toughest operating conditions. For example, in mining and quarrying... in road building ... on public projects.

"Caterpillar" Diesel operators find Ten-ol increasing service hours, giving sustained top-notch engine performance, and providing full lubricating protection under emergency overloads. That's why it is recommended as a "new, outstanding Diesel engine lubricant" by Caterpillar Tractor Co.

Try Sinclair Ten-ol and Sinclair Diesel fuel. Order them and other Sinclair products from your local Sinclair office, or write Sinclair Refining Company (Inc.), 630 Fifth Avenue, New York, N. Y.

Copyrighted 1937 by Sinclair Refining Company (Inc.)

SINCLAIR TENOL

is recommended as a "new outstanding Diesel engine lubricant" by Caterpillar Tractor Co.

NEW AIDS TO THE CONSTRUCTOR

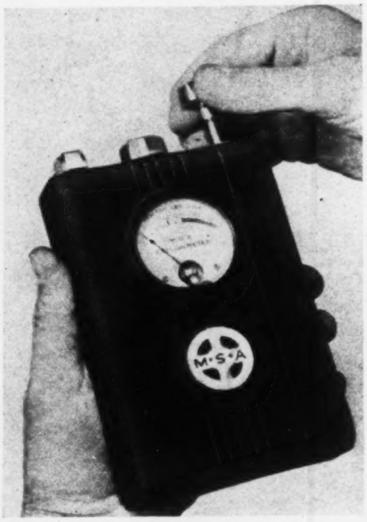
Equipment and material announcements and manufacturers' news

Pocket Gas Indicator

A pocket-sized instrument for determining the presence of combustible gas has recently been placed upon the market by Mine Safety Appliances Co. of Pittsburgh. About the size and weight of a small folding camera, the M.S.A. Explosimeter can be carried in the pocket or on a shoulder-strap.

A test with the instrument, which it is said can be made by any workman, requires the adjustment of a single control and the operation of a piston-type pump. The gas concentration is readable on the indicating meter, and the meter also shows whether the concentration is within or above the explosive range.

In operation, the pump draws a sample of the atmosphere to be tested through a length of hose into the Explosimeter. The hose-line may be of any length. In the instrument, the gas sample flows over a hot platinum wire which forms part of a balanced electrical circuit, current for which is provided by a small two-cell dry battery. The detector unit is balanced against the filament of a small electric light bulb burning in an inert atmosphere.



Combustion of gases on the surface of the detector filament creates an increase in the temperature of the wire and consequently an increase in its resistance, thus causing the electric circuit to be unbalanced. This unbalancing of the circuit causes deflection of the pointer of the electrical meter, proportional to the concentration of gas in the atmosphere being tested. The meter is graduated in per cent of the lower explosive limit.

A single control is used to turn the instrument on and off, balance the electrical circuit, and indicate the extent to which the battery has been consumed.

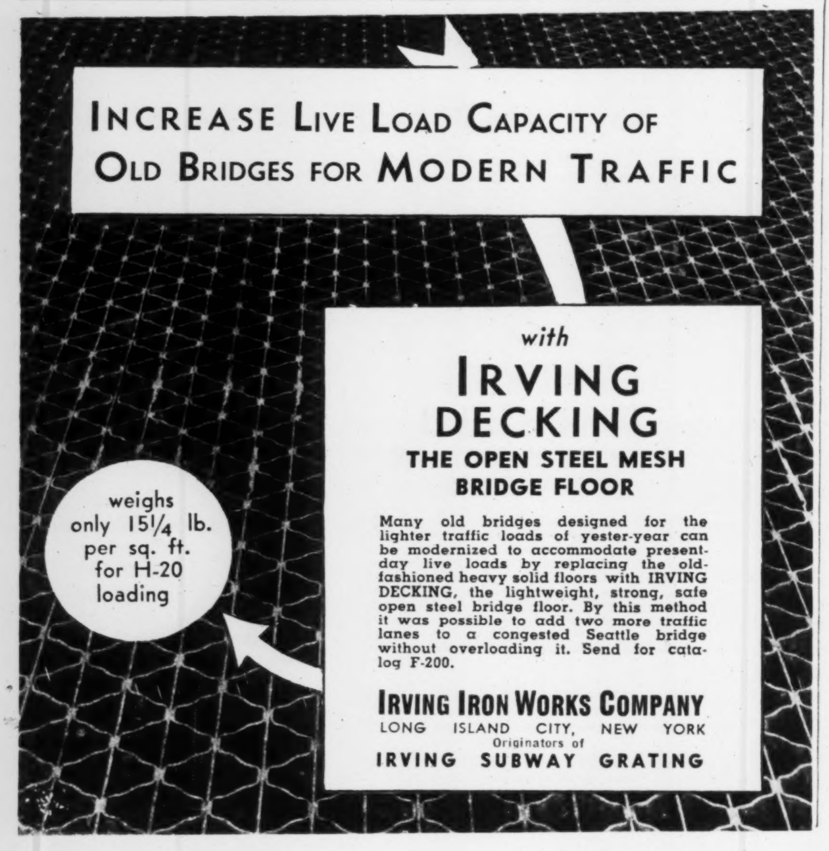
EQUIPMENT IN BRIEF

A **Gas Line Cock** with recessed ends for use on curb box installations has been added to the line of the Crane Co., Chicago. The new cocks are recessed at each end sufficiently to cover the entire threaded pipe surface, preventing the entrance of grit or moisture.

Glare from snow fields adjacent to buildings is reduced by means of a new product, Snopake, manufactured by the Skybryte Co., of Cleveland. Snopake is a pale-green adhesive liquid which can be brushed or sprayed on the windows; it admits over 90 per cent of the light but diffuses and softens it. Applied to the inside or outside of the window, Snopake remains on the glass until removed with hot water and a stiff bristle brush.

A **boiler** blow-off valve recently developed by the Hancock Valve Division of Manning, Maxwell & Moore, Inc., of Bridgeport, Conn. achieves unusually long life by means of a special "Blo-Deflector" protecting lip which deflects the boiler blow, reducing wear. Additional wear resistance is provided by stainless steel valve discs hardened to 500 Brinell and renewable valve seat rings heavily Stellited. These new blow-off valves are made in both straightway and angle types for boiler and economizer pressures of as much as 1,660 lb.

High Crushing Strength and abrasion resistance are said to be characteristic of a new floor surfacing and resurfacing material, Permastone, manufactured by Permastone, Inc., Washington, D. C. The material is furnished in a large variety of colors and shades and with a variety of structural properties. Crushing strength of different types varies from 4,000 to 10,000 lb. per sq.in. and hardness from Ha 17 to Ha 26. Material is


INCREASE LIVE LOAD CAPACITY OF
OLD BRIDGES FOR MODERN TRAFFIC

with
IRVING
DECKING
THE OPEN STEEL MESH
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Many old bridges designed for the lighter traffic loads of yester-year can be modernized to accommodate present-day live loads by replacing the old-fashioned heavy solid floors with IRVING DECKING, the lightweight, strong, safe open steel bridge floor. By this method it was possible to add two more traffic lanes to a congested Seattle bridge without overloading it. Send for catalog F-200.

weighs only 15¼ lb. per sq. ft. for H-20 loading

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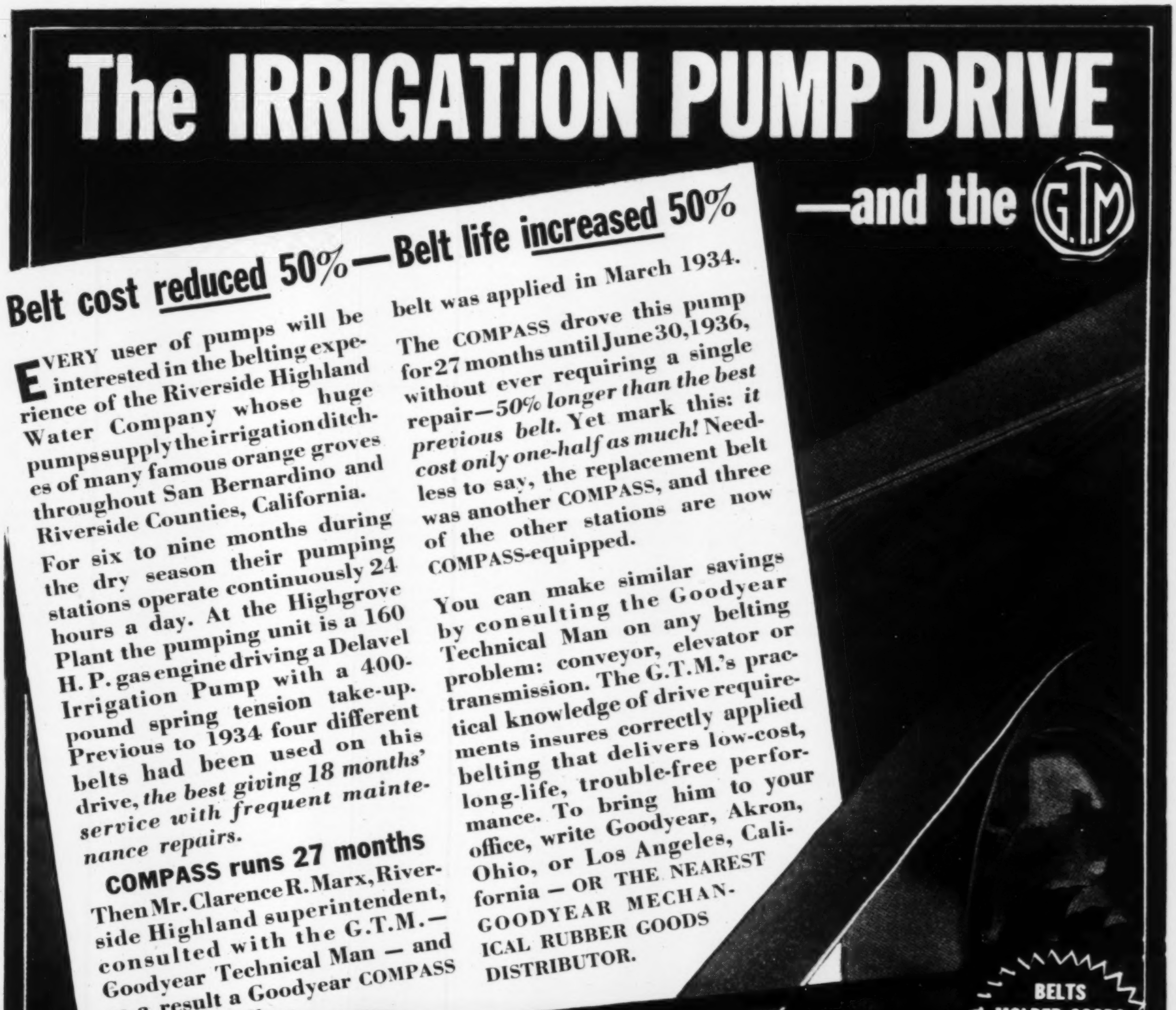


The IRRIGATION PUMP DRIVE

—and the G.T.M

Belt cost reduced 50%—Belt life increased 50%

EVERY user of pumps will be interested in the belting experience of the Riverside Highland Water Company whose huge pumps supply the irrigation ditches of many famous orange groves throughout San Bernardino and Riverside Counties, California.

For six to nine months during the dry season their pumping stations operate continuously 24 hours a day. At the Highgrove Plant the pumping unit is a 160 H. P. gas engine driving a Delavel Irrigation Pump with a 400-pound spring tension take-up. Previous to 1934 four different belts had been used on this drive, *the best giving 18 months' service with frequent maintenance repairs.*

COMPASS runs 27 months

Then Mr. Clarence R. Marx, Riverside Highland superintendent, consulted with the G.T.M.—Goodyear Technical Man — and as a result a Goodyear COMPASS "40" truly endless belt was applied in March 1934.

The COMPASS drove this pump for 27 months until June 30, 1936, without ever requiring a single repair—*50% longer than the best previous belt.* Yet mark this: *it cost only one-half as much!* Needless to say, the replacement belt was another COMPASS, and three of the other stations are now COMPASS-equipped.

You can make similar savings by consulting the Goodyear Technical Man on any belting problem: conveyor, elevator or transmission. The G.T.M.'s practical knowledge of drive requirements insures correctly applied belting that delivers low-cost, long-life, trouble-free performance. To bring him to your office, write Goodyear, Akron, Ohio, or Los Angeles, California — OR THE NEAREST GOODYEAR MECHANICAL RUBBER GOODS DISTRIBUTOR.

BELTS
MOLDED GOODS
HOSE
PACKING
Made by the makers of Goodyear Tires

GTM-Specified
GOODYEAR COMPASS "40" BELT
39'7" long x 17" wide—endless
for DELAVEL IRRIGATION PUMP DRIVE
Riverside Highland Water Co.,
Riverside, Calif.

160 H. P. Engine
Belt speed: 3800 F. P. M.

THE GREATEST NAME IN RUBBER

GOODYEAR

Change of Address
ONLY

A Modern Building May Require Moving Existing Structures . . . but Business Can Continue as Usual

The Brown - Thomson Building—in Hartford, Connecticut — as it was being moved by the Eichleay Engineering Corporation.

THIS nine story department store building—an 83 feet by 140 feet brick and steel frame structure weighing eight thousand tons—was moved a distance of 112 feet and pivoted 3 feet. The store remained open and conducted business as usual, without interruption. Water, electricity, telephones, steam heat and sanitary services were continuously maintained . . . and two elevators were in use during the shopping days.

Here is positive proof that it is not necessary to demolish buildings when preparing for alterations, additions, changes of grade, street widening or clearing sites for the erection of new structures. Why waste time and money wrecking property when it can be shifted intact and remain occupied during the operation? . . . *rents and services continue as usual.*

Eichleay Engineers have had many years of experience in accomplishing jobs like this . . . projects that seem to be impossible. That is because they are specialists in handling this type of work. They offer their services in the solution of any moving problems—large or small—you may encounter.

E·E·C

● BUILDING MOVING ● UNDERPINNING
● MACHINERY MOVING ● SHORING
● FOUNDATIONS ● RIGGING

WRITE TODAY for illustrated literature on any of the Eichleay services in which you may be interested . . . at no obligation, of course.

EICHLEAY ENGINEERING CORP.
311 Ross Street • Pittsburgh, Pa.
Branch Office, 1600 Arch Street, Philadelphia, Pa.

shipped from Washington as a powder and mixed on the job in mortar boxes. Installations are made only by approved contractors or, in territories where there is no local approved contractor, direct from the factory.

A New Paint Gun is said by the manufacturer to use considerably less air than other types of gun because of a special method of atomizing the paint. With this gun, made by the Saylor-Beall Manufacturing Co. of Detroit, the paint leaves the nozzle orifice enveloped in a tube of air, as in the usual type of gun. Then, instead of being played upon by a number of air streams from several side ports, it receives two blasts which are softened as they slide off baffle planes. Only these two auxiliary air streams are required to complete atomization and produce an oblong pattern. The gun is of the shut-off type for use with a air storage tank. Five sizes of nozzles are available.

Computations involved in brick masonry work are simplified by a new chart and runner put out by the Handy Chart & Pencil Co., West New York, N. J. The chart will determine the number of courses of brick to any given height with brick of 16 different heights, will specify the thickness of each mortar bed joint, and will determine the additional vertical mortar joint required when soldier or rowlock courses are to be built between jambs over openings.

MANUFACTURERS' ACTIVITIES

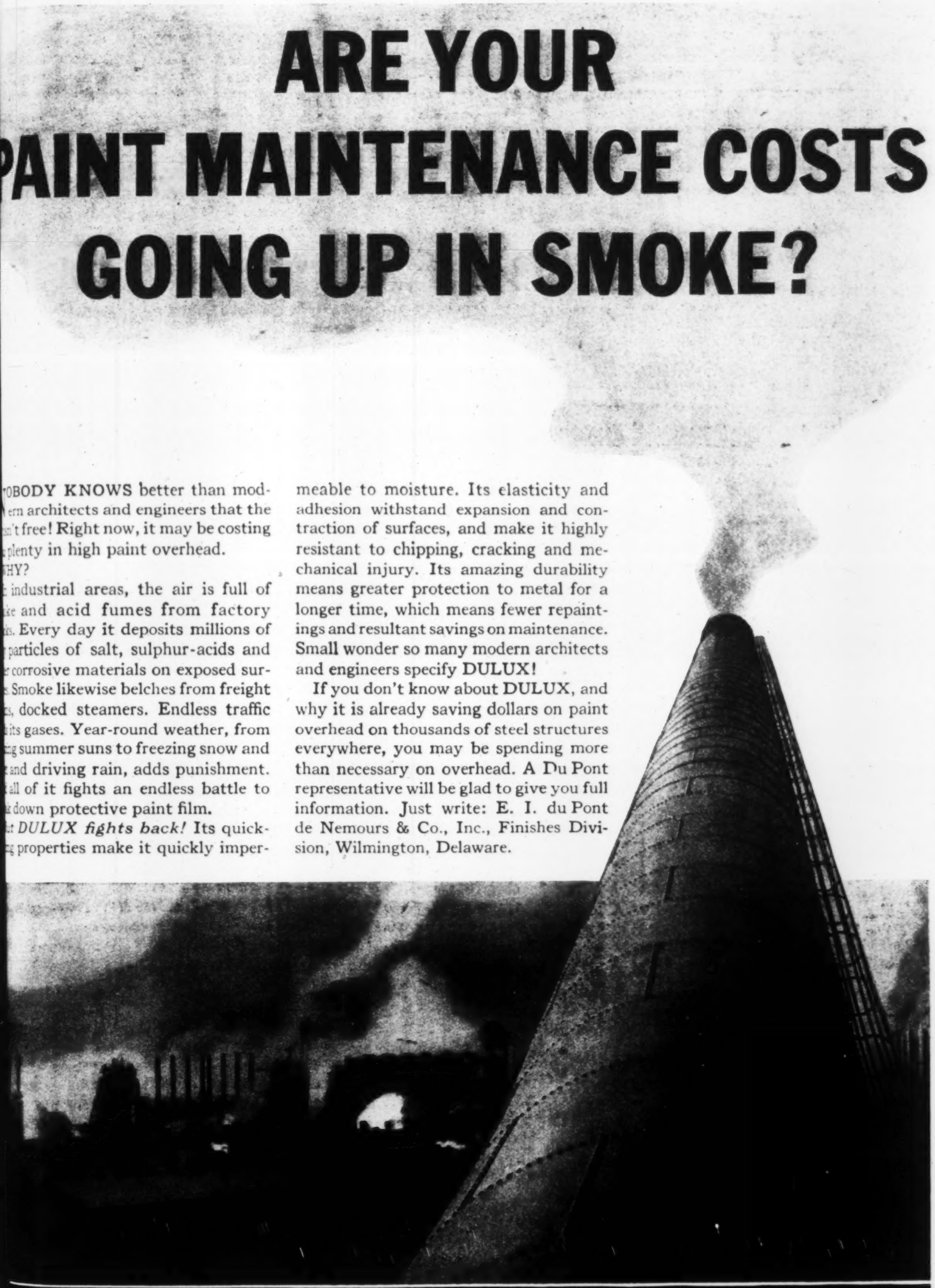
Appointment of C. Alfred Campbell, to the position of general sales director has been announced by the Marmon-Herrington Co., of Indianapolis.

New executive vice president of Caterpillar Tractor Co. is A. T. Brown. He succeeds C. Parker Holt, who returns to the San Leandro, Cal. office, where as vice president he will direct all Caterpillar activities there. L. B. Neumiller, formerly director of industrial relations, and D. G. Sherwin, formerly treasurer, have been named vice presidents.

K. M. Schaefer has been appointed assistant to the general manager by Federal Motor Truck Co.

Increased Activity has led to the appointment of R. A. McClevey as vice-president and general manager of the Murphy Diesel Co., of Milwaukee. He was formerly secretary of the Northern Illinois Coal Association.

ARE YOUR AINT MAINTENANCE COSTS GOING UP IN SMOKE?



OBODY KNOWS better than modern architects and engineers that the n't free! Right now, it may be costing plenty in high paint overhead.

HY?

industrial areas, the air is full of ke and acid fumes from factory s. Every day it deposits millions of particles of salt, sulphur-acids and corrosive materials on exposed sur- Smoke likewise belches from freight s, docked steamers. Endless traffic its gases. Year-round weather, from g summer suns to freezing snow and and driving rain, adds punishment. all of it fights an endless battle to down protective paint film.

DULUX fights back! Its quick- g properties make it quickly impermeable to moisture. Its elasticity and adhesion withstand expansion and contraction of surfaces, and make it highly resistant to chipping, cracking and mechanical injury. Its amazing durability means greater protection to metal for a longer time, which means fewer repaintings and resultant savings on maintenance. Small wonder so many modern architects and engineers specify DULUX!

If you don't know about DULUX, and why it is already saving dollars on paint overhead on thousands of steel structures everywhere, you may be spending more than necessary on overhead. A Du Pont representative will be glad to give you full information. Just write: E. I. du Pont de Nemours & Co., Inc., Finishes Division, Wilmington, Delaware.

DU PONT REG. U. S. PAT. OFF.

DULUX

REG. U. S. PAT. OFF.

GREATER PROTECTION TO METAL—AT LOWER COST

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

WATER MAIN, BOSTON

OWNER: Boston City Transit Department; Wilbur W. Davis, Chief Engineer.

PROJECT: Installation of 1,960 ft. 42-in. welded steel water pipe in Huntington Ave., Irvington, Botolph and West Newton Sts., in connection with the Huntington Ave. subway now under construction in Boston.

BIDS: Nine bids were opened in September, 1937, ranging from the contract low of $38,847 to $43,316, based on excavation by others, completion scheduled at twelve weeks after contract award, and minimum hourly wage rates of $1.50 for skilled and 60c. for common labor.

LOW BIDDERS:

1. Walsh Holyoke Steam Boiler Works, Inc., Holyoke, Mass. (contract)	$38.847
2. C. & R. Const. Co., Roslindale, Mass	39.396
3. V. Barletta Co., Roslindale, Mass	39.960

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Welded steel pipe, 42 in	1,960 l. f.	$19.82	$20.10	$20.25

DAM TRESTLES, MISS. RIVER

OWNER: U. S. Engineer Dept., Rock Island, Illinois.

PROJECT: Construction of 35 Poiree dam trestles with stringers and stringer buffers, to form steel A-frames to support timber needles for temporary dam for lock and dam gates for Mississippi River locks, and delivering them f.o.b. U. S. Siding, Keokuk, Iowa.

BIDS: Fourteen bids were received October, 1937, ranging from the contract low of $15,615 to $25,057.

LOW BIDDERS:

1. Worden-Allen Co., Milwaukee, Wis. (contract)	$15,615
2. Mississippi Valley Struct. Steel Co., Melrose Park, Ill	15,768
3. The R. C. Mahon Co., Chicago, Ill	17,263

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Structural steel	244,684 lb.	$0.044	$0.0443	$0.0458
2. Steel forgings	36,468 lb.	.11	.1174	.1355
3. White oak timber	3.159 M.b.m.	265.00	205.00	353.00

SIPHON DROP TURNOUT ALL AMERICAN CANAL

OWNER: U. S. Bureau of Reclamation, L. J. Foster, Const. Engineer, Yuma, Ariz.

PROJECT: Construction of siphon drop turnout and drainage inlets for the All American Canal, Boulder Canyon Project, California.

BIDS: Three bids were opened November, 1937, ranging from $66,542 to $119,028, for Schedules I and II combined, with completion stipulated for the turnout inlet transition, gate section and barrels under Schedule I within 150 days; the remainder of the schedule within 200 days, and the work comprising Schedule II within 120 days. Minimum hourly wages are $1.25 for skilled and 60c. for common labor. Contractor furnishes form materials and everything not entering into the completed construction, water, backfill, dry rock paving and riprap, labor and hauling of all materials required for the completed project.

LOW BIDDERS:

1. Norman I. Fadel, Los Angeles, Calif	$66.542
2. Bennett & Taylor, Los Angeles, Calif	95.107
3. Gates & Huntley, Los Angeles, Calif	119.028

SCHEDULE I

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Structural excav	23,700 c. y.	$0.25	$0.65	$0.70
2. Enlargement excav., Yuma Canal	7,500 c. y.	.50	.55	.50
3. Excav., raising banks, Yuma Canal	15,900 c. y.	.20	.27	.50
4. Overhaul	43,400 sta. c. y.	.015	.025	.03
5. Compacted subbase	500 c. y.	.50	1.25	2.00
6. Backfill, structures	7,500 c. y.	.18	.15	.50
7. Puddling backfill	1,250 c. y.	.40	.50	4.00
8. Conc., structures	1,460 c. y.	14.50	16.00	26.00
9. Place reinf. bars	250,000 lb.	.02	.0225	.04
10. Install elastic joint filler	370 s. f.	.30	.75	1.00
11. Install rubber water stops	365 l. f.	.50	.75	1.00
12. Dry-dock paving	250 s. y.	3.50	3.00	4.00
13. Gravel blanket under riprap	260 c. y.	3.00	3.50	5.00
14. Riprap	1,154 c. y.	5.00	4.40	4.50
15. Construct reverse filters	116 c. y	2.50	2.50	5.80
16. Lay open joint c. i. Pipe, 4 in., 6 in. diam.	1,000 lb.	.10	.10	.10
17. Install c. i. pipe, threaded con's	900 lb.	.10	.15	.10
18. Drive steel sheet piling	253,000 lb.	.016	.03	.025
19. Install pipe handrails	550 lb.	.10	.20	[illegible]
20. Install gate, gate hoists	25,700 lb.	.07	.035	[illegible]
21. Install Misc. Metalwork	5,100 lb.	.10	.09	[illegible]
22. Electric met. conduit, 1 in. diam	250 l. f.	.50	.30	1.00
23. Electric met. conduit, 1 in. diam., or more	50 l. f.	50	.40	1.00

SCHEDULE II

Item	Quan.	Unit Prices (1)	(2)	(3)
24. Structural excav	1,200 c. y.	0.70	4.00	1.50
25. Backfill	730 c. y.	.40	1.50	1.00
26. Tamping backfill	265 c. y.	.50	2.00	1.00
27. Concrete, structures	265 c. y.	14.50	21.15	30.00
28. Place reinf. bars	27,200 lb.	.02	.04	.05
29. Dry dock paving	1,100 s. y.	3.50	7.00	4.00
30. Riprap	80 c. y.	5.00	10.00	5.00
31. Rubber water stops	86 l. f.	.50	1.25	2.00

DELAWARE WATER TUNNEL, N. Y.

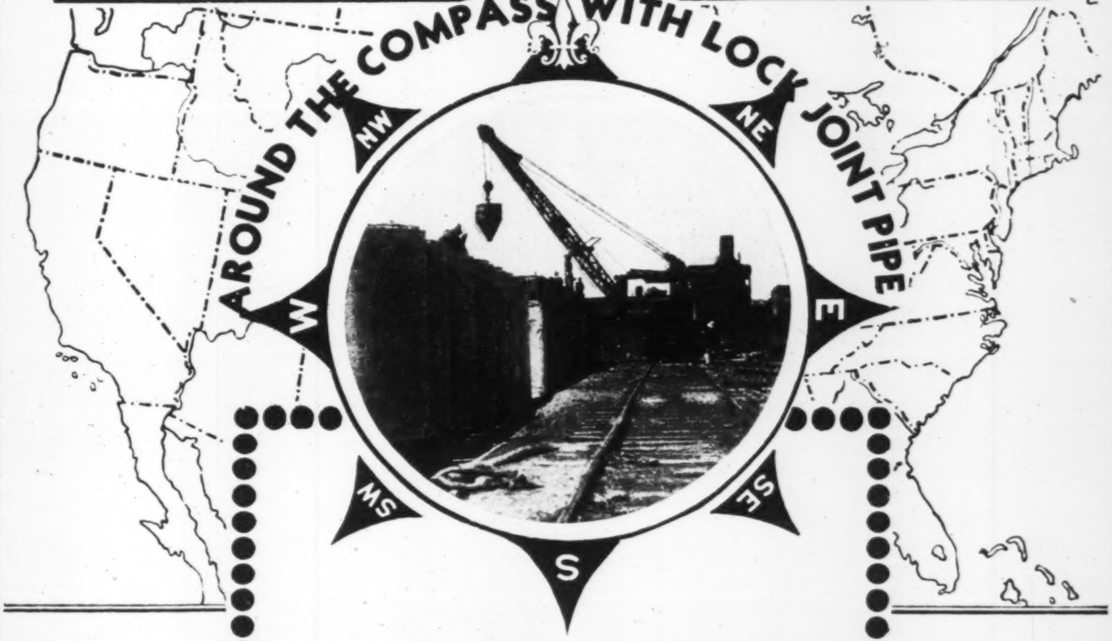
OWNER: Board of Water Supply, New York City. W. E. Spear, Chief Eng.

PROJECT: Three contracts, 322, 323 and 324 for sections of Delaware River Aqueduct tunnel in Putnam and Westchester Counties, aggregating 20 miles in length. Tunnel section is 15 ft. circular diameter, 10-in. minimum concrete lining. Each contract section includes two shafts of varying diameters and depths. Much of ground will require steel timbering. Contract time 66 months, contract bond, each section, $1,200,000. Tunnel lengths and shaft depths: Contract 322, 33,400 ft.; shaft 11, 310 ft. (offset, requires 600 ft. of 12-ft. drift); shaft 12, 356 ft.; Contract 323, 30,600 ft.; shaft 13, 375 ft.; shaft 14, 560 ft.; Contract 324, 37,100 ft.; shaft 15, 530 ft.; shaft 16, 390 ft. Shafts mostly in rock.

CONDITIONS: All shafts easily accessible. Power available at rates quoted in specifications. Labor rates are high, minimums designated in specifications, most skilled trades listed at $2.125; unskilled at 80c. (see *ENR* Nov. 18, 1937, p. 811 for list of rates).

(Contract Unit Prices continued on second following page)

In the Central States



THE rapid growth, both residential and industrial, of many cities throughout our Central States has often resulted in serious problems of water supply, particularly in the furnishing and distributing of large quantities of water to areas already occupied by large buildings, busy streets and extensive railroad yards.

Such installations call for a pipe which can be laid readily over, under or around existing underground obstructions; a pipe which will be preeminently safe under paved streets or important railroads and a pipe whose original high carrying capacity will be retained permanently so that there will be no future, uneconomic loss of capacity where demands are even greater.

Lock Joint Reinforced Concrete Pipe has ably demonstrated its Adaptability and Dependability to meet all these requirements.

SOME LOCK JOINT PIPELINES IN THE CENTRAL

Kansas City, Mo.	1920	1.5 miles	48
East St. Louis, Ill.	1925	10.3 miles	48 and 54
Louisville, Ky.	1931	7.3 miles	48 and 60
	1933	0.9 miles	36

SEWER
CULVERT
PRESSURE
SUBAQUEOUS

LOCK JOINT
Reinforced Concrete
PRESSURE PIPE

LOCK JOINT
PIPE COMPANY
Established 1905
AMPERE, NEW JERSEY

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

WATER MAIN, BOSTON

OWNER: Boston City Transit Department; Wilbur W. Davis, Chief Engineer.

PROJECT: Installation of 1,960 ft. 42-in. welded steel water pipe in Huntington Ave., Irvington, Botolph and West Newton Sts., in connection with the Huntington Ave. subway now under construction in Boston.

BIDS: Nine bids were opened in September, 1937, ranging from the contract low of $38,847 to $43,316, based on excavation by others, completion scheduled at twelve weeks after contract award, and minimum hourly wage rates of $1.50 for skilled and 60c. for common labor.

LOW BIDDERS:

1. Walsh Holyoke Steam Boiler Works, Inc., Holyoke, Mass. (contract) $38,847
2. C. & R. Const. Co., Roslindale, Mass 39,396
3. V. Barletta Co., Roslindale, Mass 39,960

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Welded steel pipe, 42 in.	1,960 l. f.	$19.82	$20.10	$20.25

DAM TRESTLES, MISS. RIVER

OWNER: U. S. Engineer Dept., Rock Island, Illinois.

PROJECT: Construction of 35 Poiree dam trestles with stringers and stringer buffers, to form steel A-frames to support timber needles for temporary dam for lock and dam gates for Mississippi River locks, and delivering them f.o.b. U. S. Siding, Keokuk, Iowa.

BIDS: Fourteen bids were received October, 1937, ranging from the contract low of $15,615 to $25,057.

LOW BIDDERS:

1. Worden-Allen Co., Milwaukee, Wis. (contract
2. Mississippi Valley Struct. Steel Co., Mel Park, Ill ....
3. The R. C. Mahon Co., Chicago, Ill ....

Item	Quan.	Unit (1)	(
1. Structural steel	244,684 lb.	$0.044	$0
2. Steel forgings	36,468 lb.	.11	
3. White oak timber	3.159 M.b.m.	265.00	205

SIPHON DROP TURNO ALL AMERICAN CANA

OWNER: U. S. Bureau of Reclamation, L. J. Fo Engineer, Yuma, Ariz.

PROJECT: Construction of siphon drop turnout age inlets for the All American Canal, Bould Project, California.

BIDS: Three bids were opened November, 193 from $66,542 to $119,028, for Schedules I and II with completion stipulated for the turnout inlet gate section and barrels under Schedule I within the remainder of the schedule within 200 day work comprising Schedule II within 120 days. hourly wages are $1.25 for skilled and 60c. fo

labor. Contractor furnishes form materials and everything not entering into the completed construction, water, backfill, dry rock paving and riprap, labor and hauling of all materials required for the completed project.

LOW BIDDERS:

1. Norman I. Fadel, Los Angeles, Calif $66,542
2. Bennett & Taylor, Los Angeles, Calif 95,107
3. Gates & Huntley, Los Angeles, Calif 119,028

SCHEDULE I

Item	Quan.	Unit Prices (1)	(2)	
1. Structural excav	23,700 c. y.	$0.25	$0.65	$0.70
2. Enlargement excav., Yuma Canal	7,500 c. y.	.50	.55	.50
3. Excav., raising banks, Yuma Canal	15,900 c. y.	.20	.27	.50
4. Overhaul	43,400 sta. c. y.	.015	.025	[illegible]
5. Compacted subbase	500 c. y.	.50	1.25	2.00
6. Backfill, structures	7,500 c. y.	.18	.15	.50
7. Puddling backfill	1,250 c. y.	.40	.50	1.00
8. Conc., structures	1,460 c. y.	14.50	16.00	26.00
9. Place reinf. bars	250,000 lb.	.02	.0225	.04
10. Install elastic joint filler	370 s. f.	.30	.75	1.00
11. Install rubber water stops	365 l. f.	.50	.75	1.00
12. Dry-dock paving	250 s. y.	3.50	3.00	4.00
13. Gravel blanket under riprap	260 c. y.	3.00	3.50	5.00
14. Riprap	1,154 c. y.	5.00	4.40	4.00
15. Construct reverse filters	116 c. y.	2.50	2.50	5.80
16. Lay open joint c. i. Pipe, 4 in., 6 in. diam.	1,000 lb.	.10	.10	.10
17. Install c. i. pipe, threaded con's	900 lb.	.10	.15	.10
18. Drive steel sheet piling	253,000 lb.	.016	.03	.025
19. Install pipe handrails	550 lb.	.10	.20	.10
20. Install gate, gate hoists	25,700 lb.	.07	.035	.10
21. Install Misc. Metalwork	5,100 lb.	.10	.09	.10
22. Electric met. conduit, 1 in. diam	250 l. f.	.50	.30	1.00
23. Electric met. conduit, 1 in. diam., or more	50 l. f.	50	.40	1.00
SCHEDULE II				
24. Structural excav	1,200 c. y.	0.70	4.00	1.50
25. Backfill	730 c. y.	.40	1.50	1.00
26. Tamping backfill	265 c. y.	.50	2.00	1.00
27. Concrete, structures	265 c. y.	14.50	21.15	30.00
28. Place reinf. bars	27,200 lb.	.02	.04	.05
29. Dry dock paving	1,100 s. y.	3.50	7.00	4.00
30. Riprap	80 c. y.	5.00	10.00	5.00
31. Rubber water stops	86 l. f.	.50	1.25	2.0

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In the Central States

AROUND THE COMPASS WITH LOCK JOINT PIPE
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THE rapid growth, both residential and industrial, of many cities throughout our Central States has often resulted in serious problems of water supply, particularly in the furnishing and distributing of **large quantities of water** to areas already occupied

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PIPELINES
RAL

5 miles	48
3 miles	48 and 54
3 miles	48 and 60
9 miles	36

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PIPE

LOCK JOINT
PIPE COMPANY
Established 1905
AMPERE, NEW JERSEY

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(*Contract Unit Prices continued from page 30*)

BIDS: Proposals opened Nov. 9, 1937. Three bids received for Contract 322, $11,996,145 to $13,973,800; three for Contract 323, $10,961,765 to $12,313,004; four for Contract 324, $10,985,695 to $13,415,170.

LOW BIDDERS: Three low bidders given at head of unit price tabulations.

CONTRACT 322

1. Geo. H. Flinn Corp., New York (contract)	$11,996,145
2. Foley Bros., Inc., New York and Winston Bros. Co., Minneapolis	13,337,700
3. Frazier-Davis Const. Co. and G. L. Tarlton, St. Louis	13,973,800

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Test-boring	2,500 l. f.	$4.50	$6.00	$10.00
2. Sink shaft in earth	1,000 c. y.	16.00	50.00	16.00
3. Sink shafts in rock	8,000 c. y.	30.00	120.00	28.00
4. Excav. tunnel	390,000 c. y.	15.38	16.35	18.00
5. Enlarge shafts, tunnel, drift	7,500 c. y.	11.00	22.00	25.00
6. Cement mortar coatings	1,000 c. y.	25.00	20.00	80.00
7. Steel ground supports	6,500,000 lb.	.09	.127	.11
8. Timber	1,000 M.b.m.	120.00	130.00	120.00
9. Dry packing	4,500 c. y.	5.00	15.00	12.00
10. Pumping	300,000 Mill.f.g.	.14	.60	.90
11. Drainage channels	35,000 l. f.	6.00	10.00	6.00
12. Steel lining, risers	220,000 lb.	.11	.13	.08
13. Outer masonry forms, shafts	600 l. f.	50.00	100.00	100.00
14. Forms, lining steel risers	500 l. f.	25.00	22.00	6.00
15. Lining forms, tunnel	35,200 l. f.	10.00	7.00	3.00
16. Conc. masonry, shafts	5,500 c. y.	25.00	20.00	40.00
17. Conc. masonry, tunnel	163,000 c. y.	10.14	10.00	12.00
18. Excess conc. masonry	17,300 c. y.	5.00	5.00	5.00
19. Bit. curing sol.	140,000 s. y.	.09	.08	.08
20. Drill holes, rock or masonry	40,000 l. f.	1.20	1.00	1.50
21. Steel pipes, grouting	30,000 l. f.	.60	1.00	.60
22. Make connections, grouting	8,500 ea.	3.00	1.50	2.00
23. Sand for filters and grout, mortar coatings	5,500 c. y.	3.60	3.25	5.00
24. Mix, place grout	18,000 c. y.	18.60	20.00	40.00
25. Remove soil	55,000 c. y.	4.00	1.00	1.00
26. Earth excav., open cut	36,000 c. y.	4.00	1.25	1.00
27. Rock excav., open cut	2,500 c. y.	8.00	12.00	5.50
28. Refill, embank.	60,000 c. y.	2.00	.60	.40
29. Dress, grass surface	40,000 c. y.	1.69	1.50	1.00
30. Timber, open cut	150 M.b.m.	120.00	150.00	120.00
31. Conc. masonry, open cut	3,000 c. y.	15.00	25.00	15.00
32. Granolithic finish	700 s. y.	3.00	3.00	5.00
33. Vitrified pipes	2,500 l. f.	2.50	.60	3.00
34. Dry rubble masonry, paving	100 c. y.	20.00	15.00	8.00
35. Rubble masonry; paving, mortar	100 c. y.	25.00	20.00	10.00
36. Crushed stone, gravel	225 c. y.	5.00	5.00	10.00
37. Portland cement	453,000 bbl.	2.00	2.00	2.80
38. Steel, reinf. conc.	540,000 lb.	.08	.06	.06
39. Structural steel	290,000 lb.	.09	.08	.11
40. Pile steel sheet	475,000 lb.	.06	.05	.10
41. Misc. iron	85,000 lb.	.14	.20	.15
42. Galvanizing	40,000 lb.	.03	.04	.10
43. Set equip. furn. by City	275,000 lb.	.06	.10	.05
44. Misc. bronze, etc.	3,000 lb.	1.00	.69	.50
45. Engineer's offices	2,200 s. f.	15.00	12.00	7.00
46. Chlorinators	7 ea.	4,000.00	5,000.00	5,000.00
47. Liquid chlorine	400,000 lb.	.10	.06	.10
48. Sanitary services	L.S.	75,000.00	100,000.00	7,500.00
49. Clean up	L.S.	40,000.00	12,000.00	2,500.00

CONTRACT 323

1. Siems-Helmers, Inc., Johnson, Drake & Piper, Inc., and Leo Butler & Bros. Co., Freeport, N. Y. (contract)	$10,961,765
2. Mason & Hanger Co., Inc., New York	11,928,025
3. Utah Const. Co., Ogden, Utah	12,313,004

(Deduct $337,500 if awarded contract 324)

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Test-borings	1,000 l. f.	$6.25	$7.00	$3.65
2. Excav. shafts	18,500 c. y.	38.00	40.00	26.00
3. Excav. tunnel	355,000 c. y.	14.00	12.20	16.00
4. Enlarge shafts, tunnels, drifts	7,500 c. y.	13.50	10.00	15.00
5. Cem. mortar coatings	900 c. y.	50.00	30.00	21.00
6. Stl sup. shafts, tunnel, drifts	6,000,000 lb.	.0675	.075	.085
7. Timber, shafts, tunnel, drifts	1,000 M.b.m.	100.00	125.00	118.00
8. Dry packing	4,000 c. y.	6.00	6.00	7.75
9. Pump shafts, tunnel, drifts	350,000 Mill f.g.	.45	.35	.26
10. Drain channels, shafts, tunnels, drifts	31,800 l. f.	29.00	5.00	7.00
11. Cut channels, water stop	650 s. f.	6.00	1.50	5.00
12. Steel lining, shaft, drifts	1,100,000 lb.	.078	.10	.097
13. Steel lining, risers	280,000 lb.	.10	.10	.127
14. Masonry lining forms, Shaft 14	570 l. f.	12.50	25.00	23.20
15. Outer masonry lining forms, Shaft 13	350 l. f.	20.00	50.00	65.40
16. Inner masonry lining forms, Shaft 13	620 l. f.	35.00	30.00	88.20
17. Forms, lining steel risers, Shaft 13	760 l. f.	4.50	10.00	13.3
18. Duct forms, Shaft 13	680 l. f.	9.00	15.00	11.10
19. Masonry lining forms, tunnel	31,000 l. f.	4.25	15.00	5.85
20. Conc. Masonry, shafts, drifts	12,000 c. y.	8.00	25.00	17.75
21. Conc. masonry, tunnel	150,000 c. y.	6.65	14.00	11.20
22. Excess conc. masonry	16,000 c. y.	5.00	5.00	5.00
23. Bit. cur. sol	130,000 s. y	.10	.30	.13
24. Drill holes, rock or masonry	40,000 l. f.	1.10	1.00	1.40
25. Steel pipes, grouting	30,000 l. f	.65	1.00	.60
26. Make conn. for grouting	9,000 ea.	2.00	5.00	15.00
27. Sand for filters, grout, cem. mortar coatings	5,500 c. y.	4.50	5.00	4.00
28. Mix, place grout	16,000 c. y.	11.25	20.00	15.00
29. Remove soil	37,000 c. y.	.65	1.50	.65
30. Earth excav.	15,000 c. y.	1.60	2.00	.83
31. Rock excav., open cut.	5,000 c. y.	5.00	7.00	3.00
32. Refill, embank	70,000 c. y.	.90	.90	.95
33. Dress, grass surface	28,000 c. y.	1.20	1.25	.90
34. Timber, open cut	200 M.b.m.	125.00	120.00	110.00
35. Conc. masonry, open cut	5,500 c. y.	22.50	30.00	30.00
36. Granolithic finish	1,600 s. y.	1.50	1.50	1.30
37. Granite trim	200 c. y.	200.00	250.00	220.00
38. Brick facing masonry	150 c. y.	45.00	90.00	50.00
39. Brick backing masonry	900 c. y.	30.00	30.00	30.00
40. Conc. roof tiles	1,150 s. y.	11.00	4.00	5.20
41. Conc. pipes, blow-off, Shaft 13	150 l. f.	3.50	5.50	4.70
42. Vit. pipes, conduits	4,000 l. f.	1.00	.85	1.00
43. Dry rubble masonry, paving	100 c. y.	20.00	11.50	10.50
44. Crushed stone, gravel	300 c. y.	7.50	4.25	5.00
45. Rubble masonry, paving, mortar	100 c. y.	35.00	14.00	14.00
46. Bit. macadam pav't	5,000 s. y.	4.00	4.25	2.50
47. Conc. pavement	250 c. y.	12.50	18.00	11.50
48. Portland cement	433,000 bbl.	1.90	2.50	2.60
49. Reinf. steel	1,000,000 lb.	.06	.075	.075
50. Structural steel	1,750,000 lb.	.065	.08	.082
51. Steel gratings, etc.	45,000 lb.	.18	.15	.13
52. C.i. pipes, fittings	140,000 lb.	.10	.06	.09
53. Misc. c. iron, steel	190,000 lb.	.11	.20	.15
54. Galvanizing	130,000 lb.	.02	.055	.10
55. Misc. bronze, brass, copper, lead	80,000 lb.	.50	.85	.50
56. Aluminum doors, sashes	27,000 lb.	1.40	1.50	1.45
57. Install, test equip. furn. by City	1,000,000 lb.	.03	.04	.05
58. Painting	350,000 s. f.	.07	.05	.06
59. Engineer's offices	4,000 s. f.	8.00	6.00	4.50
60. Chlorinators	6 ea.	5,000.00	2,150.00	2,350.00
61. Liquid chlorine	250,000 lb.	.075	.10	.11
62. Sanitary services	L.S.	30,000.00	73,000.00	65,000.00
63. Restore grounds, clean up	L.S.	25,000.00	10,000.00	20,000.00

CONTRACT 324

1. S. A. Healy Co., Chicago, Ill. (contract)	$10,985,695
2. Utah Construction Co., Ogden, Utah	12,669,460
3. Dravo Corp., Pittsburgh, Pa.	12,992,700

Item	Quan.	Unit Prices		
		(1)	(2)	(3)
1. Test borings	1,000 l. f.	$6.00	$3.65	$7.00
2. Sink shafts in rock	8,100 c. y.	20.20	31.00	26.00
3. Tunnel excavation	420,000 c. y.	13.30	16.00	15.00
4. Enlarge shafts, tunnel	7,500 c. y	10.20	15.00	15.00
5. Cem. mortar coatings	1,000 c. y.	15.00	21.00	30.00
6. Steel ground supports	7,000,000 lb.	.0665	.085	.12
7. Timber	1,000 M.b.m.	85.00	117.00	150.00
8. Dry packing	2,500 c. y	3.00	7.65	15.00
9. Pump, shafts, tunnel	450,000 Mill.f.g.	.30	.26	.40
10. Drain channels, shafts, tunnel	38,000 l. f.	9.25	7.00	11.50
11. Masonry lining forms, shafts	900 l. f.	28.00	25.00	15.00
12. Masonry lining forms, tunnel	37,200 l. f.	14.70	5.60	20.00
13. Conc. masonry, shafts	3,400 c. y.	17.40	22.00	20.00
14. Conc. masonry, tunnel	180,000 c. y.	9.54	11.20	9.50
15. Excess conc. masonry	20,000 c. y.	5.00	5.00	5.00
16. Bit. cur. sol.	150,000 s. y.	.21	.13	.10
17. Drill holes, rock or masonry	40,000 l. f.	.35	1.40	1.00
18. Steel pipes for grouting.	35,000 l. f.	1.00	.60	1.00
19. Make conn. for grouting	9,000 ea.	2.00	15.00	13.00
20. Sand for filters, grout, cem. mortar coatings.	6,000 c. y.	3.00	4.00	4.50
21. Mix, place grout	20,000 c. y.	13.00	15.00	25.00
22. Remove soil	40,000 c. y.	.50	.65	2.00
23. Earth excavation	7,000 c. y.	2.00	.82	6.00
24. Rock excav., open cut	250 c. y.	10.00	4.50	10.00
25. Refill, embank	40,000 c. y.	1.00	.95	1.00
26. Dress, grass, surface	30,000 c. y.	1.00	.90	2.00
27. Timber, open cut	120 M.b.m.	100.00	110.00	150.00
28. Conc. masonry, open cut	600 c. y.	15.00	22.00	40.00
29. Vitrified pipe	2,500 l. f.	1.00	1.00	2.00
30. Dry rubble masonry, paving	100 c. y.	10.00	10.50	15.00
31. Rubble masonry, paving mortar	100 c. y.	15.00	14.00	25.00
32. Crushed stone, gravel	200 c. y.	4.00	5.00	7.00
33. Portland cement	490,000 bbl.	2.10	2.50	2.15
34. Reinf. steel	25,000 lb.	.05	.09	.06
35. Misc. cast wrought iron, steel	25,000 lb.	.10	.15	.20
36. Engineer's offices	2,200 s. f.	16.00	4.50	9.00
37. Chlorinators	4 ea.	3,000.00	2,350.00	3,000.00
38. Liquid chlorine	25,000 lb.	.20	.11	.15
39. Sanitary services	L.S.	30,000.00	62,000.00	29,000.00
40. Clean up	L.S.	20,000.00	24,000.00	6,000.00

TIMKEN BITS

Reduce Steel Breakage

Numerous breakages in forged steels occur in a zone just back of the bit—the critical point. Frequent heating of the steel incidental to sharpening weakens it at this point and the stresses which concentrate here during drilling often prove too much for the weakened steel to resist.

You will have fewer broken steels when you use TIMKEN Bits because the shoulder construction reinforces the steel at the critical breaking point.

Furthermore, since the steels are only required to serve as holders when TIMKEN Bits are used, considerably fewer steels are required. The combination of fewer steels and fewer breakages is a source of economy no rock bit user can afford to overlook. Give TIMKEN Bits a thorough trial and you'll never go back to forged steels.

The Rock Island "Rockets" Roll On TIMKEN Bearings

GLIDE—as you ride a Timken-equipped train

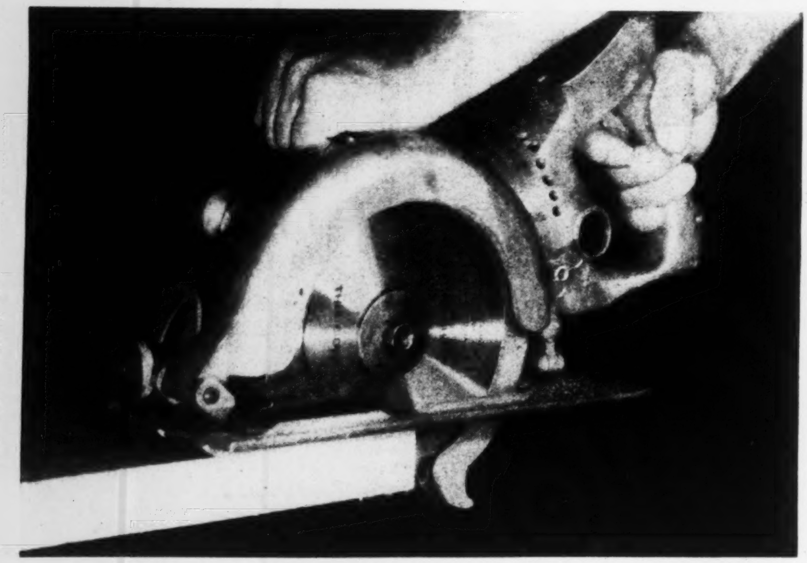
THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

Manufacturers of Timken Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; Timken Alloy Steels and Carbon and Alloy Seamless Tubing; Timken Rock Bits; and Timken Fuel Injection Equipment.

TIMKEN
ROCK BITS

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news



Safe Portable Saw

Special attention has been given to safety features in a 7-in. portable electric saw recently introduced by Black & Decker, Towson, Md. The telescoping guard covers the blade at all times except when it is cutting. The inner guard, mounted on ball bearings, opens as the saw advances into the work and springs closed when the cut is finished. The outer guard swivels on a spindle housing to follow the depth of cut adjustment as it changes.

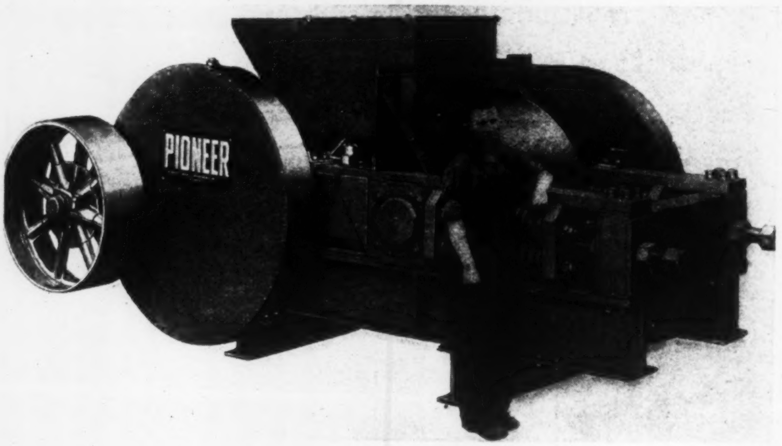
The saw has a $2\frac{3}{8}$-in. maximum depth of cut; the cut can be adjusted and set for any point up to the maximum. The saw table may be tilted for angle or bevel cutting and locked at any angle from zero to 45 deg. A detachable, adjustable rip-fence is provided which measures and guides rip cutting up to 6 in. wide. The saw complete is listed at $105.

Approval Seal to be Used On Calking Lead

The Lead Industries Association is now licensing producers of calking lead to use the lead industries' seal of approval on lead meeting the standards for purity of calking lead which were recently adopted by the association.

The standards have been established to limit impurities in the lead which would adversely affect the flexibility and durability of calked lead joints. They also require that in addition to bearing the seal of approval, calking lead shall bear the name of the manufacturer. On lead wool or other forms of calking lead on which the name and seal cannot be stamped or cast, these identification marks must appear on the label or package.

Use of the seal on standard pipe and fittings was introduced in January 1937, and the calking lead standard and seal became effective Nov. 1.



Larger Roll Crusher

The Pioneer Gravel Equipment Mfg. Co. recently announced a new and larger roll crusher with rolls 54 in. in diameter and 24 in. wide. It is designed for commercial quarries and large plants that require greater production and a larger stage of reduction.

Features of the new crusher include manganese steel shells, positive adjustment, star gear drive, Timken bearings, spring release, and enclosed gears.

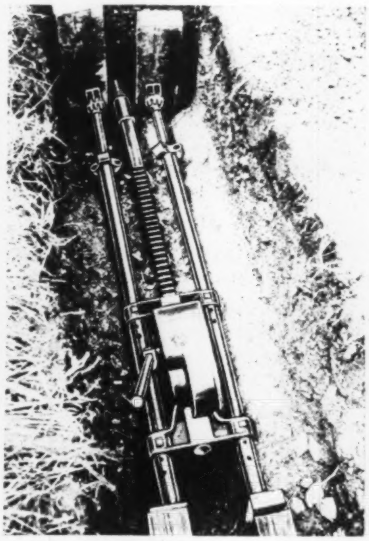
EQUIPMENT IN BRIEF

An Arc Welding electrode, known as Transweld, which has been introduced by the Lincoln Electric Co. of Cleveland, is designed particularly for use with small alternating current transformer-type arc welders. Transweld has a very heavy extruded coating.

Pulley and fly-wheel diameters can be increased with a new fibre lagging with an improved clamp which has been developed by the Rockwood Mfg. Co., Indianapolis. The fibre surface is said to grip and pull the belt without slip. Laggings are supplied in any widths up to 72 in. in diameter. They are applied by clamping on the wheel rim with a simple clamp.

A Piston Ring containing no gap and which is said to require no running in, is manufactured by the Elk Machine and Tool Works, of New York City. It consists of a resilient metal strip, corrugated and bent into a circle, bedded in a plastic material with lubricating properties.

A Galvanized Sheet with a heavy coating of commercially pure zinc which the manufacturers find will not crack or peel when the sheet is subjected to relatively severe drawing or forming operations, has been developed by the American Rolling Mill Co. of Middletown, Ohio. The new material is known as "Zincgrip." It is available in any of the basic grades of galvanized iron or steel sheet and strip manufactured by the company from 16 to 28 gage.



Pipe Jack

An improved pipe jack for jacking pipe under hillsides, lawns or streets, has been developed by the Duff-Norton Manufacturing Co. of Pittsburgh. The unit is designed for pulling or pushing pipe without changing the position of the jack once it has been lined up in the pit in the direction which the pipe or rod is to be moved.

The jack is of the geared rack type with a capacity of 25 tons. The gearing is inclosed in a grease-packed case and all gears and racks are steel with machine cut teeth. The jack handles 36 in. sections of pipe.

• • •

Portable Brinell Meter

A light-weight portable instrument that can be carried to the job to measure the Brinell hardness of metals is being produced by Teleweld, Inc. of Chicago. The Telebrineller has a weight with its carrying case of only 6½ lb. According to the manufacturer, it is not affected by hot or cold weather and is built to stand hard use.

In operation, an impression ball is held between the material to be tested and a bar of known hardness. An anvil above the assembly is then struck a sharp hammer blow. The diameters of the impressions made in the known bar and the material to be tested are then measured in 1/10 mm. by means of a calibrated microscope, included in the set. The Brinell number of the unknown metal is then obtained from the ratio of the diameters of the two impressions.

The complete outfit consists of the Telebrineller instrument proper, a bar of known hardness, a microscope with a scale etched in its focal plane, and a slide rule, as well as extra test bars and impression balls and a case.

"We have not only saved drafting time, but have found many time-saving uses for the Ozalid Process in other departments."

Reports from hundreds of enthusiastic owners of Ozalid Equipment show that the Ozalid Process not only effects substantial savings for engineering departments, but that practically every department of any company can cut photo-reproduction and duplicating costs through the use of this revolutionary process.

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. . . from a sales manager

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. . . from an office manager

"Before we installed the Ozalid 'Type 1000' Combined Printer and Developer, we deprived ourselves of the use of copies of letters and other data because of the cost and inconvenience of securing copies. Blueprints could not be used, for penciled notations were lost on the background . . . but Ozalid Prints with their white background meet our every requirement. Our Legal and Accounting Departments use this process for making copies of briefs, bills, financial reports, etc., and our Advertising Department for display drawings, shipping signs for noteworthy orders, and other uses too numerous to mention."

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MANUFACTURERS' ACTIVITIES

The Following companies recently became members of the Concrete Reinforcing Steel Institute: Bethlehem Steel Co., Carnegie-Illinois Steel Corp., Carroll-McCreary Co., Connors Steel Co., Dave Steel Co., Olney J. Dean Steel Co., Inland Steel Co., Sheffield Steel Corp. and Tennessee Coal, Iron & Railroad Co.

A New Division of the Tuthill Spring Co., at Chicago, will be devoted to metallizing, the process of spraying molten metal on a solid object.

Crane Co., of Chicago, has formed a division of engineering and research. The new Crane division, which went into operation Dec. 1, comprises the existing division of research and development and the product engineering department of the company. L. W. Wallace, head of engineering research for the Association of American Railroads, is director of the new division.

After the first of the year the Wheeled Roller will be manufactured and sold exclusively by Littleford Bros., of Cincinnati. The Wheeled Roller was originated and developed by the Wheeled Roller Corporation of San Antonio, Texas.

Personnel changes

G. D. Finney, who has been associated with the Rome Grader and Machinery Corp. for a number of years as sales manager, has become sales manager for the W. A. Riddell Corp., road machinery department.

New sales manager of Master Vibrator Co., of Dayton, Ohio, is Merle Elrick, formerly with the Moll Tool Company of Chicago.

The Appointment of Glen H. Tresler as assistant sales manager of the Black & Decker Manufacturing Co., of Towson, Md., was announced recently.

G. A. Ohl has been appointed director of sales and engineering for the Bendix-Westinghouse Automotive Air Brake Co. of Pittsburgh. Mr. Ohl was previously director of sales and acting director of engineering. Fred L. Hall, formerly eastern district manager, has been appointed sales manager, and R. H. Casler, formerly district engineer of the central district, has been appointed chief field engineer.

Alexander W. Limont, Jr., has been appointed manager of the compressor division of Sullivan Machinery Co., of Michigan City, Ind. He was formerly with E. I. du Pont de Nemours Co.

All Valve Engineering for Koppers Co.'s Western Gas Division at Fort Wayne, Ind., will be in charge of Robert Bischoff, who was formerly connected with the manufacture of hydraulic turbines in Switzerland.

Lester G. Schraub, for the past nine years manager of sales for the Wire Division of the Sheffield Steel Corp. of Kansas City, has been made general sales manager of the Union Wire Rope Corp., of the same city.

Plant expansion

An Addition to the International Harvester Co.'s tractor works at Chicago will be completed next May, it has been announced. The new addition, with buildings and equipment, will cost more than $1,000,000, and will make the company's Chicago tractor works one of the world's largest tractor manufacturing establishments. The new addition will be devoted entirely to the production of crawler-type tractors. The structure will be a one-story building of saw-tooth design with brick and steel walls and gypsum roof, providing 240,000 sq.ft. of floor space.

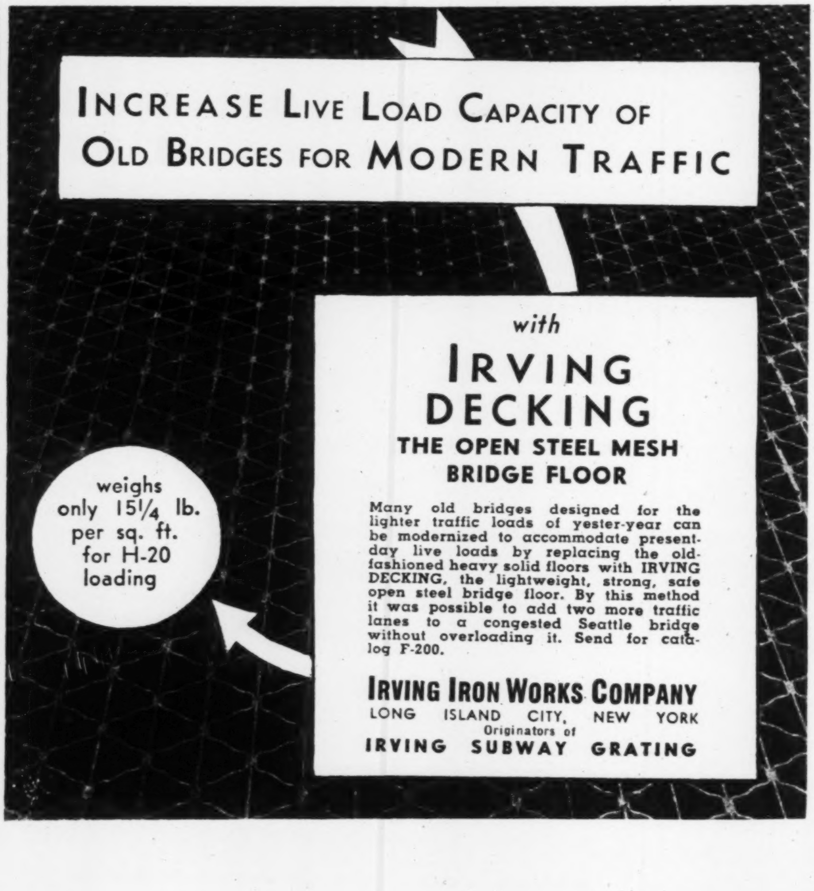
The C. R. Jahn Co. has removed its plant for manufacture of heavy duty and single purpose trailers to new and larger quarters in Chicago.

A New Plant for the manufacture of trailers and commercial and public utility truck bodies has been opened by the Baker Equipment Engineering Co., at Richmond, Va. The plant has 65,000 sq.ft. of floor space.

Office Space for management and engineering purposes has been doubled by Schubert-Christy Corp. of St. Louis.

The Thirty-seventh anniversary of Schramm Inc., West Chester, Pa., is marked by the completion of a new 25,000-sq.ft. factory addition. The new addition is part of a general program to meet the demand for Schramm's new Utility Compressor.

Extensive additions to the main factory building of the Newark, N. J. plant of the L. J. Wing Manufacturing Co. will considerably increase capacity for the production of ventilating equipment.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THE OPEN STEEL MESH BRIDGE FLOOR

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Many old bridges designed for the lighter traffic loads of yester-year can be modernized to accommodate present-day live loads by replacing the old-fashioned heavy solid floors with IRVING DECKING, the lightweight, strong, safe open steel bridge floor. By this method it was possible to add two more traffic lanes to a congested Seattle bridge without overloading it. Send for catalog F-200.

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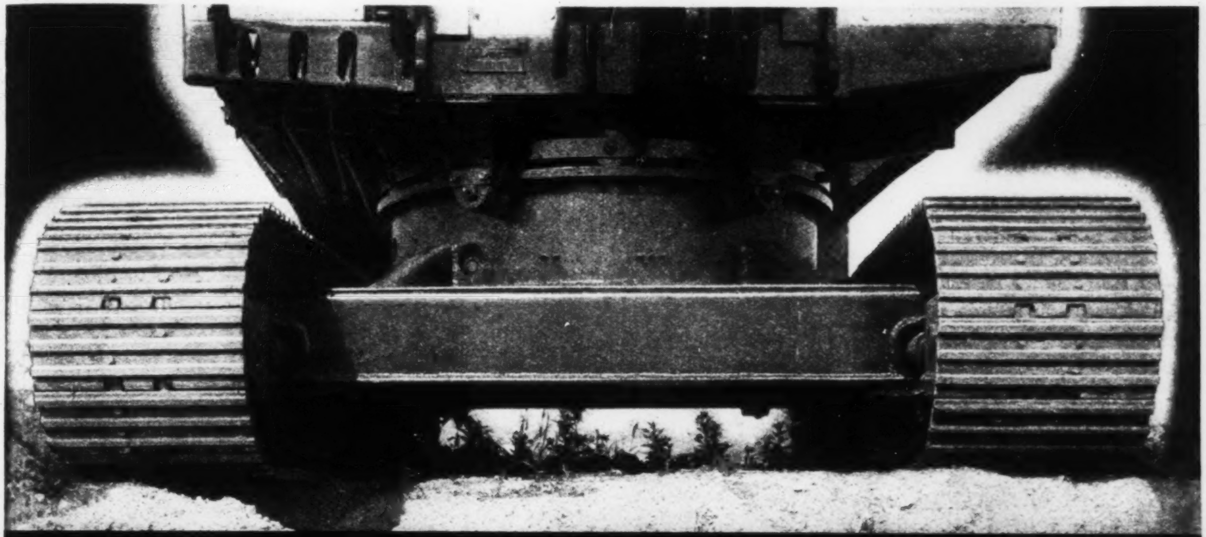
THESE ARE THE INDUSTRY'S *Most Dependable* CRAWLERS



P&H Pacemakers-FASTER ON THE JOB

J. L. HICKOX
When it comes to moving, the only machine that beats my P&H is a tractor.

● It's a fact that these tractor-type crawlers (found on all P&H machines from $3/8$ to $1\frac{1}{2}$-yard) will travel faster and farther with less trouble than any other type used on excavators. Powerful chain drives and crawler belts are always kept at proper tension with compensator springs . . . you get the true rolling movement that means smooth tractor travel and far less chance of breakdown. For information on the size machine you need, address the Harnischfeger Corporation, 4404 W. National Avenue, Milwaukee, Wis.

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CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

GRAND COULEE HIGH DAM

OWNER: U. S. Bureau of Reclamation; R. F. Walter, chief engineer; F. A. Banks, construction engineer.

PROJECT: Completion of the Grand Coulee Dam on the Columbia River in eastern Washington to its full length of 4,500 ft. and full height of 550 ft., including left bank power house and 450-ft. dam flanking main dam at left end which will house twelve pumping units. Practically all foundation excavation, base of main dam to about one-third of ultimate height of structure and foundations for two power houses completed under previous contract. Both main and pump plant dams are straight gravity concrete structures; total concrete over 10,000,000 cu.yd., of which nearly 6,000,000 cu.yd. will be placed under new contract. Contract includes installation of 30 outlet control structures, steel penstocks, eleven spillway drum gates 28 x 135 ft., and concrete multiple arch highway bridge over central spillway section, 1,650 ft. long. Mass concrete will be artificially cooled by existing plant. Foundation will be grouted under low and high pressure schedules. Metal sealing strips will be placed in expansion joints.

CONDITIONS: Under terms of previous contract certain plant items, including most of the concrete plant, belonging to the previous contractor, is made available to the new contractor for $500,000. Town and camp facilities are also included in this arrangement. The government has built highway and rail access to the project. Contract completion time has been set at 1,450 days; penalty $2,000 daily. Minimum wage rates have been stipulated for all classes of labor; unskilled labor, 60c.; skilled $1.20 to $1.50; semiskilled 65c. to $1.00.

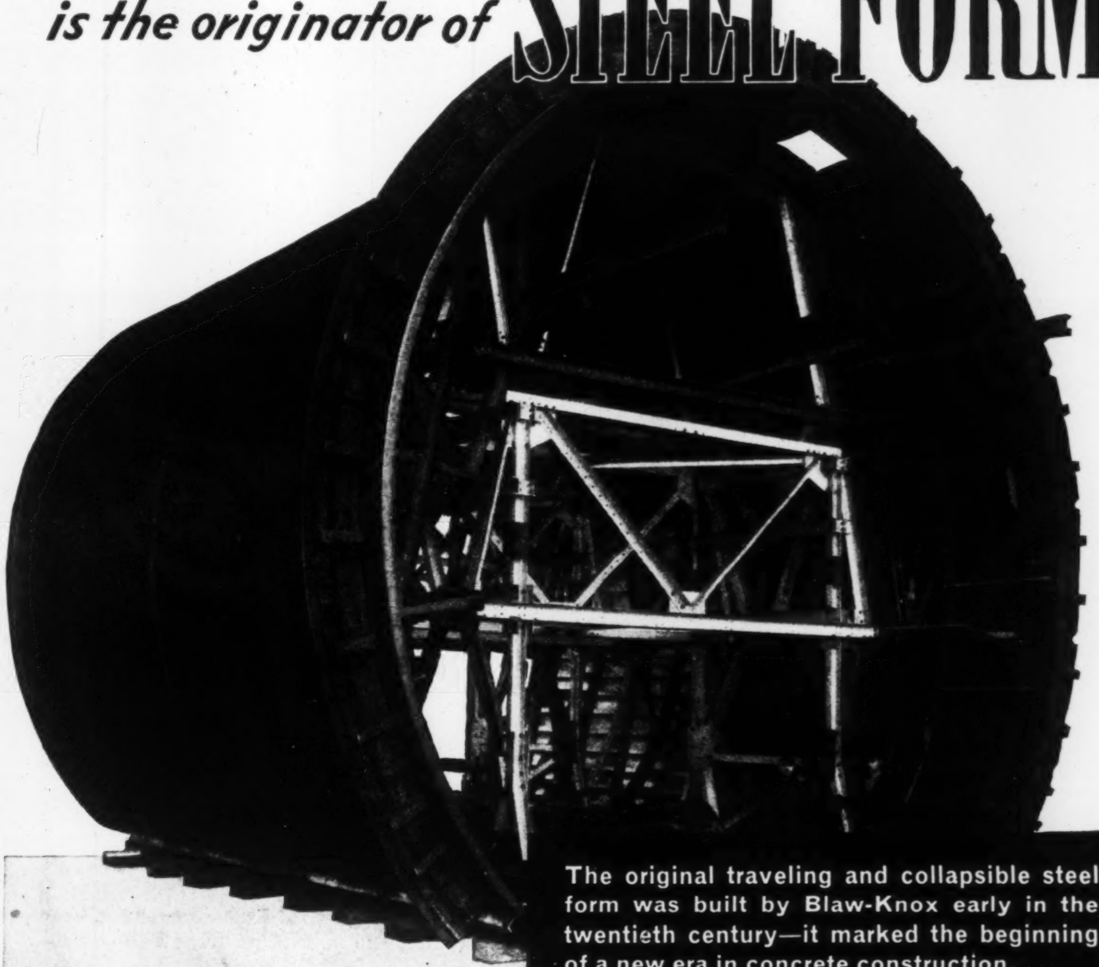
The government furnishes all cement, steel, machinery and other permanent material and equipment incorporated into the structure. The contractor supplies all construction plant, temporary construction material, such as form lumber, and all sand and gravel aggregate, available at a nearby government-owned gravel deposit. The river is now flowing over the base of spillway section of the dam. As the section is raised, the flow will be shifted from one side to the other, the lake backing up as the structure rises, until the outlet control works are installed in three horizontal levels. By the time the level of the second set of outlets has been reached the first set (roughly at top of present base) will carry normal flow of river.

BIDS: Two bids were received at opening at Spokane on Dec. 10. Net low bid was $34,442,240, submitted by Interior Const. Co., a combination of Mason-Walsh-Atkinson-Kier Co., present contractors on the base of the dam, the old group of Six Companies Inc., builders of Boulder Dam, and the General Const. Co., of Seattle; headquarters listed as Latham Square Bldg., Oakland, Calif. Second and only other bid, $42,185,802, submitted by Pacific Constructors, Inc., a combination of eight Western firms. Complete bid tabulations follow: (1) Interior Const. Co.; (2) Pacific Constructors, Inc.

Item	Quan.	Unit Prices	
		(1)	(2)
1. River diversion	L.S.	$727,000.00	$100,000.00
2. Remove temp. suspension bridge	L.S.	10,000.00	40,000.00
3. Strip gravel deposits	475,000 c. y.	.30	.30
4. Excav., fdn. common	10,000 c. y.	1.50	7.00
5. Excav., fdn. rock	210,000 c. y.	3.75	7.00
6. Trim rock fdns., prev. excav.	11,000 c. y.	6.00	10.00
7. Excav. open cut for tunnels	800 c. y.	6.00	7.00
8. Excav. pump plant drain tunnel	900 c. y.	25.00	20.00
9. Excav. pump plant discharge tunnels	5,000 c. y.	10.00	20.00
10. Excav. other tunnels, elev. shafts	5,000 c. y.	19.00	20.00
11. Excav. common, hwys., railroad	1,500 c. y.	1.50	3.50
12. Excav. rock, hwys., railroad.	118,000 c. y.	2.00	3.50
13. Excav. silt & debris from struct	3,000 c. y.	2.75	6.00
14. Excav. of concrete	300 c. y.	45.00	7.00
15. Chipping existing concrete.	18,000 s. f.	.70	.30
16. Backfill	1,000 c. y.	.75	.50
17. Compacted fill	18,000 c. y.	1.15	1.00
18. Riprap	3,000 c. y.	3.00	1.50
19. Rubble masonry walls	600 c. y.	14.00	20.00
20. Grouted paving	1,500 s. y.	2.85	2.00
21. Place 18-in. corr. metal pipe.	400 l. f.	1.75	1.00
22. Place waterbound macadam base	6,000 c. y.	3.00	1.50
23. Crushed rock road surface	3,200 c. y.	3.30	1.50
24. Haul and spread road oil	77,000 gal.	.05	.10
25. Mix & place oil-treated surface	24,000 s. y.	.40	.15
26. Guardrails	4,500 l. f.	.60	2.00
27. Lay ties and rail	750 tr. ft.	1.70	1.00
28. Apply rail anchors	850 ea.	.20	.50
29. Ballast track	600 c. y.	3.00	1.50
30. Drill B grout holes, 0–30 ft.	15,000 l. f.	1.90	2.00
31. Drill B grout holes, 30-50 ft.	4,000 l. f.	1.90	2.25
32. Drill C grout holes, 30–75 ft.	3,000 l. f.	1.90	2.50
33. Drill C grout holes, 75–125 ft.	9,000 l. f.	1.90	2.75
34. Drill A grout holes, 0–50 ft.	11,000 l. f.	2.05	2.00
35. Drill A grout holes, 50–100ft.	11,000 l. f.	2.05	2.25
36. Drill A grout holes, 100–150 ft	34,000 l. f.	2.75	2.50
37. Drill A grout holes, 150–200 ft	42,000 l. f.	3.00	4.00
38. Drill A grout holes, 200–500 ft	4,000 l. f.	4.00	5.00
39. Drill drain holes, 0–25 ft	3,000 l. f.	3.15	2.25
40. Drill drain holes, 25–50 ft	40,000 l. f.	3.50	2.50
41. Drill drain holes, 50–75 ft	1,000 l. f.	4.00	2.75
42. Drill drain holes, 75–100 ft.	2,000 l. f.	4.50	3.00
43. Drill drain holes, 100–150 ft.	1,000 l. f.	5.50	3.50
44. Drill drain holes, 150–200 ft.	7,000 l. f.	6.00	4.00
45. Drill weep holes	300 l. f.	1.75	1.00
46. Drill and grout anchors	600 l. f.	2.30	1.00
47. Pressure grouting	170,000 c. f.	1.40	1.50
48. Fill small pipe by grouting	20,000 c. f.	1.85	1.00
49. Make and place porous conc. tile	131,000 l. f.	1.15	1.00
50. Sewer drains, 6 in	800 l. f.	1.15	1.00
51. Concrete in dam	5,500,000 c. y.	3.53	5.42
52. Concrete, spillway training walls	3,700 c. y.	11.50	12.00
53. Concrete, trash racks	51,000 c. y.	25.00	25.00
54. Concrete, twist adjust. slots.	3,600 c. y.	18.50	20.00
55. Concrete lining tunnels, shafts	2,100 c. y.	30.00	22.00
56. Concrete, cable gallery	240 c. y.	30.00	22.00
57. Concrete, spillway crest, piers	85,000 c. y.	15.00	10.00
58. Concrete, parapets	2,300 c. y.	30.00	20.00
59. Concrete, elev. towers	4,100 c. y.	30.00	33.00
60. Concrete in bridges	7,400 c. y.	45.00	26.00
61. Concrete in powerhouse substruct	37,000 c. y.	15.00	12.00
62. Concrete, powerhouse intermediate struct	37,000 c. y.	24.00	12.00
63. Concrete, powerhouse superstruct	30,000 c. y.	38.00	20.00
64. Second stage concrete, powerhouse	12,000 c. y.	19.00	10.00
65. Concrete paving	900 c. y.	35.00	30.00
66. Concrete, bulkheads	40 c. y.	35.00	30.00
67. Concrete backfill shafts	900 c. y.	15.00	10.00
68. Concrete backfill conduits	220 c. y.	75.00	20.00
69. Concrete backfill penstocks.	41,000 c. y.	7.00	10.00
70. Conc. backfill pipes over 8 in.	600 c. f.	2.25	1.00
71. Conc. backfill twist adjust. slots	28,000 c. y.	8.00	8.00
72. Furn. & install steel tunnel liner plates	125,000 lb.	.09	.06
73. Place reinf. bars and mats	50,000,000 lb.	.023	.017
74. Special finish concrete surf.	35,000 s. y.	.90	1.00
75. Finish lighting recesses	2,200 ea.	5.75	2.00
76. Conc. cover reinf. dowels	40 c. y.	28.00	20.00
77. Insulating reinf. bars and conduit	250,000 ea.	.06	.15
78. Welding reinf. bars	7,100 ea.	.85	1.50
79. Remove protecting cover from reinf. bars	59,000 l. f.	.30	.05
80. Paint dowel bars	25,000 l. f.	.20	.10
81. Splice broken reinf. bars	700 ea.	4.00	5.00
82. Test welded bar splices	500 ea.	9.00	5.00
83. Remove concrete bulkheads, pipe gal	8 ea.	100.00	100.00
84. Remove conc. bulkheads, manholes	9 ea.	25.00	10.00
85. Remove temp. metal seal strips	4,000 l. f.	.70	1.00
86. Repair existing metal seal strips	4,000 l. f.	1.40	1.00
87. Install metal seal strips	425,000 l. f	.60	.60

(*Items continued on second following page*)

BLAW·KNOX *is the originator of* STEEL FORMS



Blaw-Knox Traveling Steel Tunnel Forms. Four 70 ft. long sections of these 28 ft. 8 in. forms were furnished for lining the diversion tunnels at the Fort Peck Dam in Montana.

The original traveling and collapsible steel form was built by Blaw-Knox early in the twentieth century—it marked the beginning of a new era in concrete construction.

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These advantages of steel forms still persist—and over thirty years of experience on thousands of large and small jobs throughout the world ***qualifies*** Blaw-Knox as the "ace" of steel form designers and builders.

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for your
next concrete job
large or small·consult

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OFFICES AND REPRESENTATIVES THROUGHOUT THE WORLD

BLAW-KNOX

(Contract Unit Prices continued from page 20)

Item	Quan.	Unit Prices (1)	Unit Prices (2)
88. Install metal seal strips, powerhouse	8,000 l. f.	1.15	.75
89. Install grout tubing for contr. joints	1,400,000 lb.	.17	.06
90. Install tubing and fittings for conc. cooling system	4,700,000 lb.	.09	.06
91. Dismantle cooling headers and fittings	1,250,000 lb.	.09	.02
92. Install cooling headers and fittings	750,000 lb.	.09	.05
93. Install cover plates on grout grooves	137,000 l. f.	.60	.25
94. Install expansion joint filler	147,000 s. f.	.25	.15
95. Place joint filler in twist adjust. slots	11,000 s. f.	.25	.15
96. Remove joint filler in twist adjust. slots	10,000 s. f.	.45	.50
97. Install timber supports in twist adjust. slots	2,000 l. f.	1.75	2.00
98. Place sand fill in twist adjust. slots	25,000 c. y.	1.25	1.50
99. Remove sand, timber, etc. from twist adjust. slots	28,000 c. y.	3.50	2.00
100. Place and reliquefy asphalt seals	6,000 l. f.	2.00	.25
101. Install felt roofing and flashing	59,000 s. f.	.30	.08
102. Install bit. mastic on roofs	59,000 s. f.	.20	.10
103. Place 2-in. cork on roofs	9,000 s. f.	.25	.10
104. Lightweight concrete in floors	600 c. y.	20.00	20.00
105. Place bonded concrete floor finish	30,000 s. y.	4.50	1.00
106. Place cement wall base	600 l. f.	.90	.50
107. Make and place 3-in. precast terrazzo floor slabs	500 s. f.	2.50	1.00
108. Install terrazzo treads, risers, wall base for stairs	600 l. f.	2.75	1.50
109. Install bonded terrazzo floors and landings, 2½ in	8,000 s. f.	2.25	.50
110. Install unbonded terrazzo floors and landings, 3 in	5,000 s. f.	2.25	.60
111. Install terrazzo cove base	1,500 l. f.	1.75	1.50
112. Apply liquid floor hardner	30,000 s. y.	.18	.05
113. Install glass block panels	8,000 s. f.	1.15	.50
114. Make and place percast concrete frames for glass panels	120 c. y.	70.00	50.00
115. Install struct. glass partitions	500 s. f.	1.15	1.00
116. Install glass wainscot	11,000 s. f.	1.15	.50
117. Construct suspended ceilings	1,100 s. y.	2.85	1.00
118. Hollow metal lath plaster walls	60 s. y.	4.50	5.00
119. Plaster on concrete walls, ceilings	1,500 s. y.	2.20	1.00
120. Install terra cotta	500 s. y.	5.75	1.50
121. Paint concrete walls	8,500 s. y.	.45	.25
122. Install lead sheet membrane wpfg	2,000 s. f.	.90	.25
123. Install 5-ply bit. membrane wpfg	16,000 s. f.	.30	.15
124. Waterproofing exterior walls	7,500 s. y.	.85	.30
125. Install drum gates	15,300,000 lb.	.033	.027
126. Install drum gate control mech	1,300,000 lb.	.06	.05
127. Install gate frames, seats, etc	5,870,000 lb.	.06	.027
128. Install penstock intake gates	600,000 lb.	.03	.025
129. Install bulkhead gates	725,000 lb.	.017	.02
130. Install penstock intake gate hoists	290,000 lb.	.045	.05
131. Install outlet conduit gates, hoists and linings	26,000,000 lb.	.02	.02
132. Install control mech. for hydraulic gates	51,000 lb.	.09	.10
133. Install upstream sections penstocks	1,350,000 lb.	.023	.02
134. Install pump inlet pipes	900,000 lb.	.03	.025
135. Drill, tap, plug grout holes in penstocks, pump inlets	1,000 ea.	5.75	2.00
136. Install metal pier noses in draft tubes	375,000 lb.	.018	.025
137. Install structural steel	2,110,000 lb.	.016	.027
138. Install traveling and gantry cranes	2,660,000 lb.	.013	.027
139. Install track rails	1,860,000 lb.	.023	.015
140. Install trash rack guides	5,200,000 lb.	.021	.027
141. Install trash racks	18,600,000 lb.	.009	.015
142. Clean, paint interior of penstocks	43,000 s. y.	.70	.50
143. Install misc. piping under 6 in	430,000 lb.	.10	.075
144. Install misc. piping over 6 in.	4,200,000 lb.	.06	.06
145. Remove leaded-in. plugs	300 ea.	7.00	2.00
146. Remove grouted-in. bulkheads	7 ea.	25.00	10.00
147. Remove grouted-in. pipe covers	11 ea.	10.00	5.00
148. Install metal handrails	46,000 lb.	.09	.10
149. Install aluminum handrails, curbs	10,000 lb.	.30	.20
150. Install metal stairways	341,000 lb.	.035	.05
151. Install metal floor frames, gratings	427,000 lb.	.045	.03
152. Install metal drain inlets	50,000 lb.	.045	.05
153. Install metal protectors for conc. edges	9,000 lb.	.12	.10
154. Install metal bearing plate assemblies	100,000 lb.	.045	.06
155. Install drain pumps and accessories	60,000 lb.	.045	.075
156. Install oil storage tanks	104,000 lb.	.03	.03
157. Install metal accordion doors	1,000 s. f.	.45	.25
158. Install metal swinging doors.	6,000 s. f.	.45	.25
159. Install metal swinging gates.	1,500 lb.	.09	.10
160. Install metal sash windows.	600 s. f.	.45	.50
161. Install metal partitions	700 s. f.	.55	.50
162. Install metal inserts	35,000 lb.	.25	.10
163. Install metal exp. joints in floors	3,000 l. f.	.45	1.00
164. Install metal exp. joint facing in walls	2,500 l. f.	.45	1.00
165. Install misc. metal work	136,000 lb.	.12	.10
166. Install wooden doors	450 s. f.	.50	.25
167. Install plumbing fixtures	9,000 lb.	.30	.15
168. Install metal elec. conduit, under 1¼ in	90,000 l. f.	.45	.20
169. Install metal elec. conduit, 1¼–3 in	44,000 l. f.	.50	.20
170. Install metal elec. conduit, over 3 in	5,500 l. f.	.80	.20
171. Install non-metallic elec. conduit	1,000 l. f.	.45	.20
172. Install electrical apparatus.	60,000 lb.	.20	.10
173. Install electrical conductors.	100,000 lb.	.25	.10
174. Install ground wires	46,000 lb.	.40	.10
175. Install elec. cable embedded in concrete	83,000 l. f.	.12	.06
176. Operate concrete cooling plant	900 days	115.00	100.00
177. Transporting penstocks, Odair to dam	210 ton	4.50	1.00
178. Trans. penstock, pump mat. Odair to fabricating plant.	9,000 ton	1.15	.50
179. Trans. penstocks fab. plant to dam	8,000 ton	4.50	.50
180. Trans. freight on const. RR. for others from del. yd. to siding at head of Grand Coulee	300 cars	55.00	25.00
181. Same, l. c. l. freight	5,000 cwt.	.30	.10
182. Trans. freight for others from del. yd. to govt. warehouse	100 cars	70.00	10.00
183. Same, l. c. l. freight	2,000 cwt.	.30	.10
184. Trans. freight for others from siding at head Grand Coulee to powerhouse	1,000 tons	4.00	.50

Subtotals: (1) $34,942,240; (2) 42,685,802. Net bid is $500,000 less for each account of purchase of plant and camp from govt.

DETROIT SEWERS

OWNER: Commissioner Public Works, Detroit, Mich.; Geo. R. Thompson, Engineer.

PROJECT: Construction of 4,413 lin.ft. of two-barrel sewer, each barrel 14.5 ft. x 17.5 ft., in Baby Creek, Detroit. Work is to be done in open cut in bed of creek, with part of present outlet structure to be removed, and piling driven under diversion works, with 87 ft. of 6 ft. 3 in. connection with stop log slot.

BIDS: Eight bids were received September, 1937, ranging from the contract low of $993,619 to $1,899,415, with completion scheduled for December, 1938, and minimum hourly wage rates stipulated of $1.50 for skilled and 75c. for common labor, and $4.00 per hr. for diver.

LOW BIDDERS:

1. S. A. Healy Co., Chicago, Ill. (contract)	$ 993.619
2. E. J. Albrecht Co., Chicago, Ill	1,133.558
3. Spencer & Ross Inc., Detroit, Mich	1,239,350

Item	Quan.	Unit Prices (1)	Unit Prices (2)	Unit Prices (3)
1. Std. 2-bbl. sewer, 14.5 x 17.5 ft	4,413 l. f.	$197.60	$226.00	$250.00
2. Diversion works, south of Dix	l. s.	40,000.00	45,850.00	42,000.00
3. Cylinder conn., 6 ft. 3 in.	87 l. f.	35.00	70.00	100.00
4. Cylinder conn., 9.5 ft	65 l. f.	73.00	140.00	100.00
5. Box conn., 5 x 5 ft	l. s.	1,490.00	1,000.00	1,500.00
6. Small pipe conn., west sewer	4 each	250.00	300.00	250.00
7. Small pipe conn., east sewer	4 each	800.00	2,000.00	2,000.00
8. Reinf. conc. double manholes	5 each	200.00	300.00	250.00
9. Stop log slot, cover, div. works	L.S.	760.00	2,000.00	2,000.00
10. Stoplog slot cover replacement, Vernor	L.S.	350.00	1,000.00	1,500.00
11. Stoplog slot cover replacement, Industrial	L.S.	350.00	1,000.00	1,000.00
12. Engineer's field office	L.S.	6.000.00	8,000.00	10,000.00
13. Additional timber piles	117,000 l. f.	.51	.44	.45

BUILT FOR *SPEEDY* WORK...

Modern equipment performs better with Gulf lubricants and fuels

THE DIRT FLIES when modern equipment like this goes to work on a job.

And it *must move fast* — or profits fail to materialize. A big investment in costly equipment won't pay dividends when the work is interrupted for adjustments and repairs.

But it needn't be — if all equipment gets the right lubricants, properly applied at the proper intervals. And contractors don't have to pay a premium for this kind of insurance against operating troubles.

From Maine to Texas, Gulf offers contractors the cooperative service of trained lubrication engineers who are prepared to recommend the best lubrication practice for every type of equipment. From a broad line of more than 400 quality oils and greases, the Gulf engineer selects the lubricant which is exactly suited to each requirement — and then suggests the best method of application.

This careful attention to lubrication is the best insurance you can buy against operating interruptions and repair expense. A Gulf engineer is always at your service.

Gulf Oil Corporation GULF INDUSTRIAL LUBRICATION **Gulf Refining Company**

GENERAL OFFICES: GULF BUILDING, PITTSBURGH, PA.

NEW AIDS TO THE CONSTRUCTOR

Equipment and material announcements and manufacturers' news

DAVEY
DAVEY

Compressor Turns Short

Davey Compressor Co., Kent, Ohio, has introduced a 315-cu.ft. compressor which meets the problem of transporting machines of this size by using a side-by-side type of construction. As a result of this type of construction, the machine is believed to have a shorter turning radius than any other compressor of this size on the market.

The machine, which uses a multiple V-belt drive, is 127 in. long, 58 in. wide, and 70 in. high.

• • •

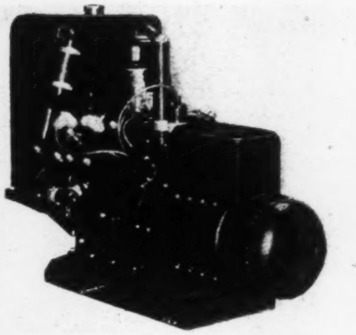
New Detonating Fuse

A detonating fuse for blasting work to insure rapid travel of the blasting wave through the charge has been developed by the Ensign-Bickford Co. of Simsbury, Conn. The new fuse, Primacord-Bickford, has an explosive wave speed of about 20,350 ft. per sec. It consists of an explosive core contained within a waterproof textile covering. The core cannot be set off by friction, fire, or any rodinary shock but must be detonated by a blasting cap attached to it.

Primacord-Bickford acts as the detonating agent for each cartridge in the hole, thus eliminating all caps from the load. Caps are not present on the job while loading and are not attached to the main line until all is in readiness to fire the blast.

Primacord weighs about 15 lb. per thousand ft. and has a tensile strength equivalent to that of Double Countered Cordeau. It is packed on wooden spools containing 500 or 1,000 ft. each.

A metal connection is used to attach the blasting cap to the Primacord. All main line connections are made by tying a square knot.



Compact Generating Plant

A new 50-watt, 110-volt a.c. electric generating plant for use as a portable unit by construction crews has been developed by D. W. Onan & Sons, of Minneapolis.

The plant is powered by a 90-deg. V-type four cylinder engine operating at 1,800 r.p.m. and developing 15 hp. Battery ignition with automotive type distributor and force feed lubrication are features of the engine.

The machine, with outside dimensions of 20 in. by 34 in. by 42 in., weighs 575 lb. It is furnished either manually started, self-starting by remote control, or fully automatic.

• • •

Air Line Anti-Freeze

"Frosto" is a new freeze preventative for air lines and air tools intended for applications where electric current is available. It is marketed by the Sullivan Machinery Co., Michigan City, Ind.

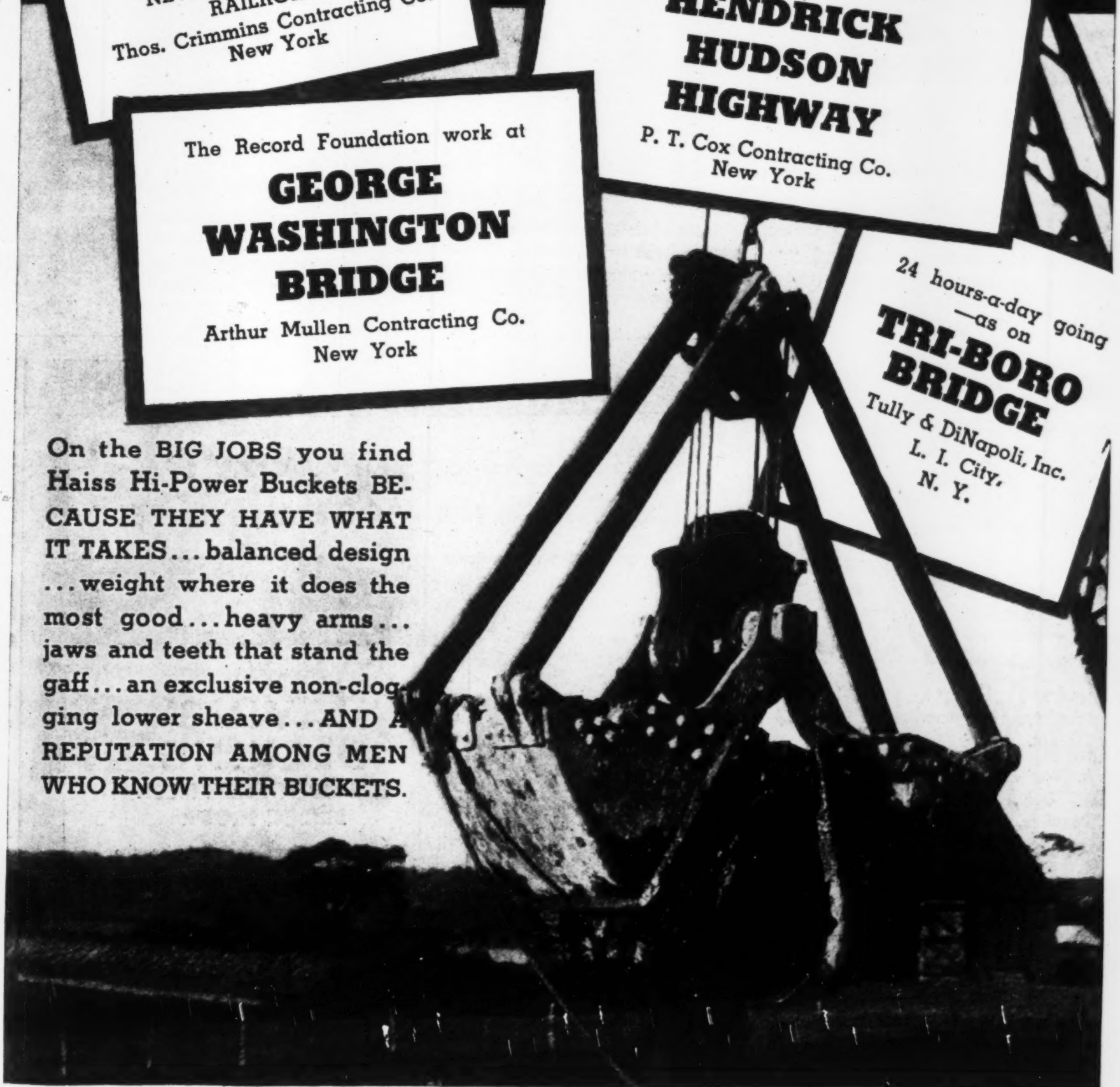
Frosto is vaporized electrically and fed into the compressed air line near the compressor as fast as is necessary to prevent freezing of water vapor in the compressed air lines and air tools.

New Scraper Shows Depth of Cut

An interesting feature of the new line of scrapers introduced by The Heil Co., of Milwaukee, is an indicator gage mounted on top of the control valve at the front of the scraper. The dial on the gage indicates the depth of cut; when the scraper is spreading earth, the same dial indicates the height of the bowl above the ground.

Only three hydraulic cylinders, which have all component parts interchangeable, are required to operate the scraper. A rotary gear pump provides the hydraulic power.

HAISS *Hi-power* for the BIG Jobs



Punishing rock and spoil work

WEST SIDE IMPROVEMENT

NEW YORK CENTRAL RAILROAD

Thos. Crimmins Contracting Co.
New York

High speed Excavation on

HENDRICK HUDSON HIGHWAY

P. T. Cox Contracting Co.
New York

The Record Foundation work at

GEORGE WASHINGTON BRIDGE

Arthur Mullen Contracting Co.
New York

24 hours-a-day going —as on

TRI-BORO BRIDGE

Tully & DiNapoli, Inc.
L. I. City,
N. Y.

On the BIG JOBS you find Haiss Hi-Power Buckets BECAUSE THEY HAVE WHAT IT TAKES... balanced design ... weight where it does the most good... heavy arms... jaws and teeth that stand the gaff... an exclusive non-clogging lower sheave... AND A REPUTATION AMONG MEN WHO KNOW THEIR BUCKETS.

WE'LL GLADLY SEND A CATALOG AND QUOTE PRICES. WRITE, WIRE OR PHONE AND TELL US THE SIZE YOU NEED.

GEORGE HAISS MANUFACTURING CO., INC., 140th Street & Rider Ave., New York, N.Y. *Distributors Everywhere*

MANUFACTURERS' ACTIVITIES

L. J. McLaughlin has been appointed mid-western district manager of the Davey Compressor Co. He was formerly sales manager of the Hug Truck Co.

Carnegie-Illinois Steel Corp. recently announced the appointment of Laurin D. Woodworth as chief metallurgist at Youngstown district plants and of Philip Schane, Jr., as chief metallurgist at the Duquesne works.

J. D. Hitch, who has been resident engineer in Tokyo for the past eight years for the Dorr Co., New York City, has returned to New York to become manager of the export division. T. B. Ford, who was assisting Mr. Hitch in Tokyo, has taken his place.

F. C. Schulze has been appointed to the post of assistant sales manager of the Waukesha Motor Co., of Waukesha, Wis.

Art Loos, formerly sales engineer with Iron & Steel Products, Inc., has been made manager in charge of buying and selling industrial machinery for the Triangle Engineering Co., of Chicago.

The Worthington-Gamon Meter Co., of Harrison, N. J., has announced the appointment of W. C. Flanders to the position of sales manager, succeeding G. H. Gleeson, recently resigned.

Distributor appointments

The Roller-Smith Co., of New York City, has appointed C. F. Cate, of El Paso, Texas, as its agent for the Southwestern portion of Texas and the Southern portion of New Mexico.

Julien P. Friez & Sons, Inc., of Baltimore, have opened new showrooms in Boston.

A New branch sales office at Portland, Ore., of Cutler-Hammer, Inc., Milwaukee, will have F. J. Woldrich as manager.

William W. Cochrane has been appointed distributor of Tri-Lok open steel flooring and American tubular hoisting towers and accessories in the State of Wisconsin by the machinery division of Dravo Corp., Pittsburgh.

The Following new representatives will handle the complete line of the Homestead Valve Manufacturing Co., of Coropolis, Pa.: Charles A. Randorf, Buffalo, N. Y.; Beeler-MacWilliams, Inc., Syracuse, N. Y.; W. E. Mushet Co., Portland, Oregon; Clowe & Cowan, Inc., Amarillo, Texas; Paul R. Winston Co., Dallas; Waterworks Equipment Co., Salt Lake City; Tazewell Buchanan, Richmond.

Ransome Concrete Machinery Co., of Dunellen, N. J., have recently appointed the following agents for their complete line: Milburn Machinery Co., Columbus, Ohio; Graham B. Wright, Richmond, Va.; Engleby Equipment Co., Roanoke, Va.

Buffalo, N. Y., and Erie, Pa., will be handled for Root-Connersville Blower Corp., of Connersville, Ind., by Buffalo Mill Supply Co., Inc., and F. W. Allen & Son, respectively.

A New sales office in Phoenix, Ariz., has been opened by Lincoln Electric Co. and R. J. Reardon will be in charge.

Link-Belt Co., of Chicago has announced the appointment of the following distributors for its line of Speed-O-Matic shovels, draglines and cranes: Tag Equipment Co., Chattanooga; Industrial Supply Co., Salt Lake City; A. W. Company, Inc., St. Paul.

Morris Machine Works, of Baldwinsville, N. Y., have appointed the Lang Co. as their representative in Salt Lake City to handle sales of Morris centrifugal pumps and hydraulic dredges.

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Crane-Hoist Control

A new direct-current crane-hoist control, making use of rocker-bearing contactors and magnetic time relays, has been announced by the General Electric Co., Schenectady, N. Y. Features claimed for the new control are high lowering speeds, good speed regulation, precise spotting of the hook, protection of motor and brake from abuse, and maximum safety.

Regenerative braking for loads requiring greater than 30 per cent braking effort reduces power consumption, and dynamic braking is available for emergency stops in case of failure of the solenoid. Deceleration is automatically controlled by a magnetic time relay. Magnetic time relays are also employed to control acceleration in both hoisting and lowering.

INCREASE LIVE LOAD CAPACITY OF OLD BRIDGES FOR MODERN TRAFFIC

weighs only 15¼ lb. per sq. ft. for H-20 loading

with

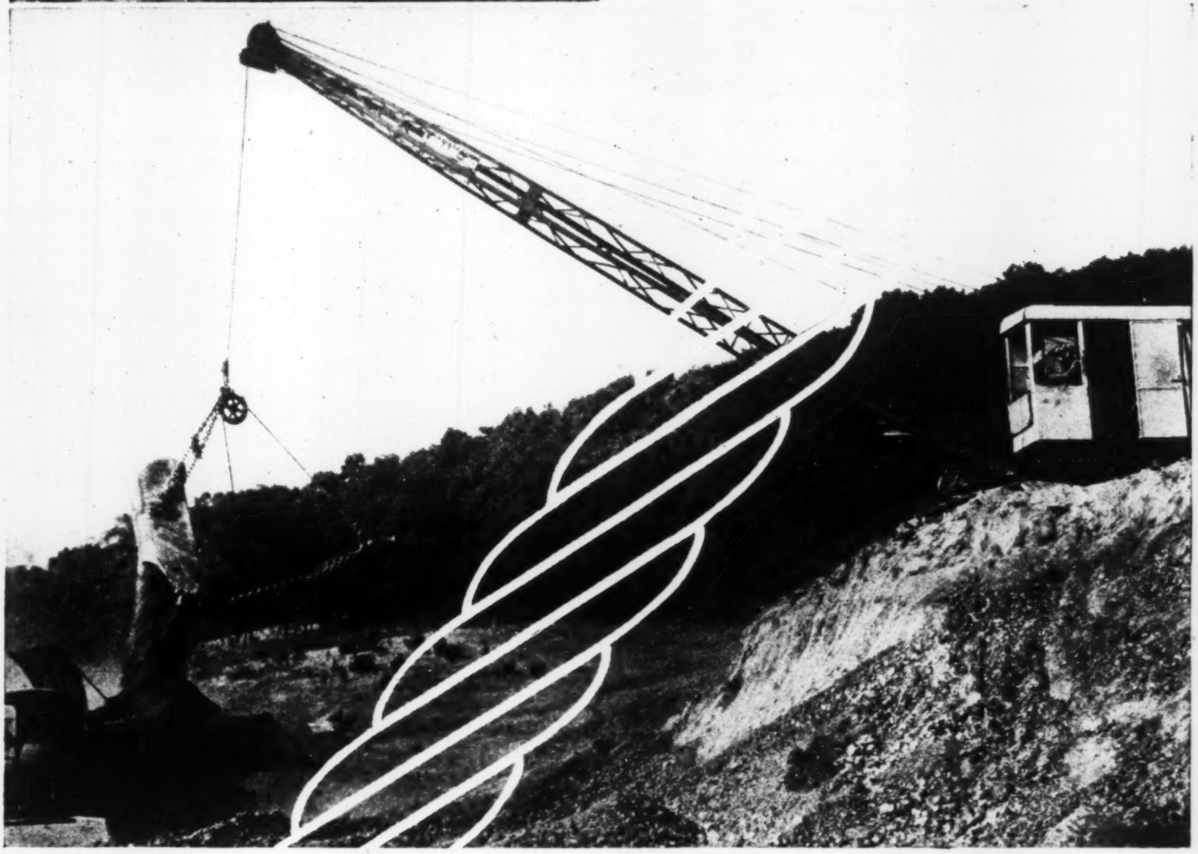
IRVING DECKING

THE OPEN STEEL MESH BRIDGE FLOOR

Many old bridges designed for the lighter traffic loads of yester-year can be modernized to accommodate present-day live loads by replacing the old-fashioned heavy solid floors with IRVING DECKING, the lightweight, strong, safe open steel bridge floor. By this method it was possible to add two more traffic lanes to a congested Seattle bridge without overloading it. Send for catalog F-200.

IRVING IRON WORKS COMPANY
LONG ISLAND CITY, NEW YORK
Originators of
IRVING SUBWAY GRATING

KNOW HOW that counts in Wire Rope



And there's plenty of "know how" back of Bethlehem Wire Rope—the accumulated experience of half a century of wire-rope manufacture by the Williamsport Wire Rope Company, recently acquired by Bethlehem. Take Drag Line on a boom machine, for example. Highest-strength steel is always specified. 6 x 19 lang-lay construction is universally used. Yet, even with these two points standardized among all rope makers, Bethlehem Drag Line has won high favor among contractors.

"Know how" enables Bethlehem to build a perfected drag line—having definite features, unique in Bethlehem ropes, which combat abrasive wear and resist the whipping action of casting. For one thing, the strands, whether Form-Set (preformed) or standard, are "back turned." As wire is twisted into strand, the individual wires themselves are given a slight twist, making them hug together. Likewise, as the strands are twisted into rope, they, too, are twisted slightly, making a tight, solid surface that has greater resistance to abrasion. This same "back turning" balances internal stresses of the rope and makes it less kinky, less likely to bird-cage, easier to handle.

A small point, perhaps. Yet any contractor familiar with Bethlehem (formerly Williamsport) Rope can immediately tell the difference. Bethlehem rope casts better. It won't twist when let loose. It wears longer.

Whether it's Purple-Strand Perfected Drag Line, or wire rope for some other use, you'll find this "know how" invariably present in Bethlehem Lines.

BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

SEDIMENTATION BASINS, ATLANTA

OWNER: Council Purchasing Committee, Atlanta, Ga.; Wiedeman & Singleton, Engineers, Atlanta: C. Donaldson, Chief City Engineer.

PROJECT: Construction of 2 sedimentation basins near Howell Mill Rd., Atlanta, Ga., to settle 32 m.g.d. muddy water pumped from river. Basins are 100x410x14 ft., and form part of the city's $1.100.000 waterworks improvement program.

BIDS: Eleven bids were opened in November, 1937, ranging from the contract low of $238.296 to a $298.740, with completion scheduled at 300 days, and minimum hourly wages stipulated of $1.50 for skilled and 30c. for common labor.

LOW BIDDERS:

1. Smith-Pew Construction Co., Atlanta. (contract)	$238.296
2. W. L. Cobb Construction Co., Atlanta	246.700
3. A. H. Guion & Co., Atlanta	247.429

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Excav. earth	62,000 c. y.	$0.40	$0.35	$0.28
2. Excav. rock	6,400 c. y.	.90	1.60	1.40
3. Cl. 150 ci.b.s. pipe, 6 in.	768 l. f.	.773	.70	.75
4. C.i.b.s. pipe, cl. A, 8 in.	32 l. f.	1.08	1.00	1.05
5. C.i.b.s. pipe, cl. A, 10 in.	720 l. f.	1.44	1.30	1.40
6. Flg. c.i. pipe, cl. A. 10 in.	17 l. f.	2.16	2.00	2.00
7. C.i.b.s. pipe, cl. A, 24 in.	696 l. f.	4.87	4.60	4.73
8. C.i.b.s. pipe cl. A, 48 in.	372 l. f.	17.10	15.00	16.60
9. Specials c.i.b.s.	40 ton	125.66	115.00	122.00
10. Set c.i.b.s. pipe, cl. 150, 6 in.	798 l. f.	.40	.50	.30
11. Set c.i.b.s. pipe, cl. A, 8 in.	32 l. f.	.50	.50	.40
12. Set c.i.b.s. pipe, cl. A, 10 in.	714 l. f.	.78	.60	.35
13. Set flg., c.i. pipe, cl. A, 10 in.	17 l. f.	.80	.60	.50
14. Set c.i.b.s. pipe, cl. A, 24 in.	722 l. f.	1.60	1.60	.90
15. Set c.i.b.s. pipe, cl. A, 48 in.	438 l. f.	4.50	3.50	1.80
16. Cone valves, 30 in.	2 ea.	2,600.00	2,400.00	2,400.00
17. Gate valves, cl. C.h.e., 6 in.	1 ea.	28.80	27.00	28.00
18. Gate valves, cl. A.f.f., 10 in.	4 ea	56.53	60.00	55.00
19. Gate valves, cl. A.h.e., 24 in.	2 ea.	300.00	330.00	300.00
20. Gate valves, cl. A.h.e., 48 in.	1 ea.	1,663.00	1,750.00	1,600.00
21. Hydrants	9 ea.	52.00	50.00	52.00
22. Sluice gates, 60 in.	2 ea.	911.00	900.00	825.00
23. Sluice gates, 20 in.	8 ea.	169.00	165.00	150.00
24. Haul, install c.i. pipe, 30 in.	787 l. f.	2.90	2.50	4.00
25. Lay conc. sewer pipe, 30 in.	200 l. f.	4.84	6.50	4.00
26. Manholes complete	7 ea.	120.00	100.00	100.00
27. Storm drain sewer pipe, 8 in.	618 l. f.	.60	1.00	.65
28. Storm drain sewer pipe, 12 in.	787 l. f.	1.00	1.60	.95
29. Sub-drains, 8 in.	2,966 l. f.	1.00	1.00	.70
30. Catch basins	L. S.	362.70	2,966.00	2,076.20
31. Excav. rock, trenches	1,032 c. y.	2.50	5.00	5.00
32. Conc. backfill, cl. C	792 c. y.	8.00	16.00	8.50
33. Comp. flocc. equip.	L.S.	19,800.00	18,000.00	17,800.00
34. Comp. clarifier equip.	L.S.	17,700.00	14,000.00	14,000.00
35. Comp. outlet weirs	L.S.	3,800.00	9,000.00	3,900.00
36. Elec. power wiring, 220 v.	L.S.	1,455.00	2,000.00	1,400.00
37. Lighting and wiring	L.S.	3,060.00	3,500.00	3,000.00
38. Fencing	L.S.	530.00	400.00	500.00
39. Concrete, excess or less	c. y.	12.00	17.00	12.00
40. Forms, excess or less	s. f.	.16	.15	.14
41. Reinf. steel, excess or less	lb.	.06	.03½	.04
42. Gunite baffles, longitudinal	6,355 s. f.	.78	.70	.79
43. Gunite baffles, transverse	3,704 s. f.	.78	.70	.79

LINCOLN TUNNEL APPROACH

OWNER: Port of New York Authority; J. C. Evans, Chief Engineer.

PROJECT: Excavation and incidental structures, Prospect Avenue, North Bergen to Bergenline Avenue, Union City, and excavation and fill between Hudson County Boulevard East and Kings Bluff in Weehawken, N. J.

BIDS: Six bids were opened in November, 1937, for Contract MHT-70, comprising the Bergenline-Prospect Avenue project, and four bids for Contract MHT-27 comprising the Weehawken project. Bids for the former ranged from $773.273 to $1.221.141; on the latter from $231.250 to $320.700.

LOW BIDDERS:

I. Contract MHT-70—Bergenline-Prospect Ave.

1. B. Perrini & Sons, Inc. Framingham, Mass.	$773,273
2. Woodcrest Construction Co., New York, N. Y.	898,896
3. Geo. M. Brewster & Son, Inc., Bogota, N. J.	1,024,678

II. CONTRACT MHT-27—WEEHAWKEN-HUDSON COUNTY

1. Jos. L. Sigretto & Son, Rutherford, N. J.	$231,250
2. Geo. M. Brewster & Son, Inc., Bogota, N. J.	297,400
3. Rusciano & Son Corp., New York, N. Y	311,500

I — MHT-70—BERGENLINE-PROSPECT AVE.

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Rock excav.	174,000 c. y.	$2.37	$3.65	$3.63
2. Earth excav.	64,000 c. y.	2.37	1.00	3.63
3. Derrick placed stone	5,000 s. f.	.55	2.50	3.00
4. Concrete	1,300 c. y.	37.00	35.00	32.00
5. Structural steel	75,000 lb.	.075	.07	.06
6. Reinf. steel	45,000 lb.	.065	.07	.08
7. C. i. manhole frames, etc.	10,500 lb.	.13	.10	.11
8. Bit. conc. pavement	6,600 s. y.	2.55	2.50	2.30
9. Timber curbing	2,300 l. f.	.75	.40	.30
10. Chain link fence	800 l. f.	2.50	1.70	2.10
11. Wood fence	6,300 l. f.	2.65	3.00	2.35
12. Relink chain link fence	300 l. f.	.95	.80	1.15
13. Bridge Hudson County Boulevard	7,000 s. f.	5.50	4.00	2.90
14. Summit Avenue bridge	6,200 s. f.	10.00	7.00	3.95
15. V. c. pipe, 8 in., 10 in.	200 l. f.	.75	1.70	1.00
16. V. c. pipe, 12 in.	400 l. f.	1.15	6.43	1.30
17. V. c. pipe, 20 in.	100 l. f.	2.50	7.60	2.90
18. V. c. pipe, 24 in.	500 l. f.	3.60	8.14	5.00
19. Reinf. conc. pipe, 30 in.	150 l. f.	4.40	8.30	5.00
20. Reinf. conc. pipe, 36 in.	325 l. f.	6.90	9.50	6.30
21. Sewer flume	350 l. f.	12.00	28.50	30.00
22. Stone screenings sidewalk	1,300 s. y.	.50	.75	.45

II — MHT-27—WEEHAWKEN-HUDSON COUNTY

Item	Quan.	(1)	(2)	(3)
1. Excavation	38,000 c. y.	$6.00	$6.80	$7.00
2. Derrick placed stone	13,000 s. f.	.25	3.00	3.50

SEWAGE DISPOSAL, BALTIMORE

OWNER: Board of Awards, Dept. Public Works, Baltimore, Md.

PROJECT: Clearing sludge lagoon, building earth berm and earth dam and miscellaneous work at the Back River Sewage Disposal Plant in Baltimore.

BIDS: Five bids were opened in October, 1937, ranging from the contract low of $80,180 to a high of $282,900, with completion scheduled at 150 days, and prevailing city wages stipulated for hourly minimum scales.

LOW BIDDERS:

1. Frederico Bonadio, Baltimore (contract)	$80,180
2. Peter D'Adamo Construction Co., Baltimore	86,060
3. Vincent Schiavi, Wilmington, Del.	86,975

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Building earth dam	820 l. f.	$10.00	$11.00	$9.75
2. Building earth berm	5,000 c. y.	1.68	1.00	2.00
3. Remove sludge from lagoon	92,000 c. y.	.68	.77	.74
4. Cut drain ditches, berm	200 c. y.	2.60	1.00	2.00
5. Build, install wooden screen	L. S.	500.00	1,000.00	500.00

(*Additional Contract Unit Prices on second following page*)

R. P. M. thrives on gruelling service. It is called upon to resist the attacks of the worst types of corrosion, year after year. And it does!

R.P.M. Roofing You Can Install — and Forget!

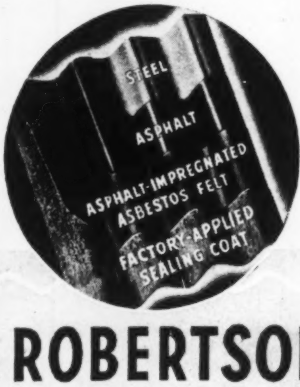
PUT roofs of Robertson Protected Metal on factory buildings. And for years to come, they will enjoy maintenance-free protection from corrosion, chemicals, salt air, fumes and every kind of weather.

Robertson Protected Metal is high in insulating value, light in weight. Factory applied coatings of asbestos felt and asphalt, sealed in by an exclusive weatherproof surface, protect every point of an R.P.M. roof from the ravages of those elements that put an end to the useful life of most roofing. Patented fasteners, also of Robertson Protected metal, facilitate installation.

Throughout the world R.P.M. has proved in actual use to be the most economical roofing per year of service obtainable. The complete facts will interest any engineer who wants roofing or siding that can be installed . . . and forgotten. Write today for our free brochure "Roofs Over Industry." It contains full details. Address H. H. Robertson Co., 2010 Grant Building, Pittsburgh, Pa.

FOR FURTHER INFORMATION SEE OUR CATALOG IN SWEET'S

Below, a cutaway section of R.P.M. Notice the triple protection special processed coatings afford, assuring in many instances 15, 20 and 25 years of economical service.


STEEL
ASPHALT
ASPHALT-IMPREGNATED ASBESTOS FELT
FACTORY-APPLIED SEALING COAT

ROBERTSON *Protected* METAL ROOFING

(Contract Unit Prices continued from page 12)

CONNECTICUT RIVER BRIDGE

OWNER: Dept. Public Works, Commonwealth of Massachusetts; Geo. H. Delano, Chief Engineer, Boston.

PROJECT: Construction of Calvin Coolidge Memorial Bridge over Connecticut River between Northampton and Hadley, Mass., comprising five-span steel deck truss bridge with concrete floor and macadam surface approaches, four concrete piers and two abutments. The structure will be 1,441 ft. long, 51 ft. wide, and 68 ft. above normal water.

BIDS: Contract was awarded in November, 1937, based on the lowest of nine bids ranging from $1,193,231 to a high of $1,521,751. Plans were prepared by Maurice A. Reidy, Consulting Engineer, and Desmond & Lord, Architects, both of Boston, Mass.

CONDITIONS: Completion is scheduled for June, 1939, with the contractor furnishing all materials and minimum hourly wages stipulated of $1.50 for skilled and 50c. for common labor. Rock bottom lies some 70 ft. below the river bed requiring composite piles under granite faced concrete piers, driven through strata of red clay and compact sand, gravel, boulders, topped off with loose coarse sand under the normal river bed silt.

LOW BIDDERS:

1. T. Stuart & Son Co., Watertown, Mass. (contract)	$1.193.231
2. Coleman Bros. Corp., Boston, Mass.	1.198.050
3. D. O'Connell's Sons, Inc., Holyoke, Mass.	1.222.048

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Earth excav.	3,100 c. y.	$50.00	$28.00	$38.00
2. Bridge excav	13,700 c. y.	.80	1.00	1.01
3. Ledge excav	80 c. y.	4.00	5.00	1.75
4. Ordinary excav	66,000 c. y.	.45	.40	.44
5. Concrete, cl. D	11 c. y.	18.00	18.00	18.00
6. Concrete, cl. C	10,700 c. y.	13.00	11.00	8.20
7. Broken stone, B. M. A. base	1,350 c. y.	3.50	3.00	2.47
8. Tar, drives	700 gal.	.12	.13	.12
9. V. c., cem. conc. sewer, 10 in.	814 l. f.	.50	.50	.36
10. V. c., cem. conc. sewer, 12 in.	382 l. f.	.60	.65	.45
11. V. c., cem. conc. sewer, 15 in.	360 l. f.	1.00	1.00	.73
12. V. c., cem. conc. sewer, 18 in.	4 l. f.	1.50	1.50	1.20
13. V. c., cem. conc. sewer, 21 in.	544 l. f.	2.00	2.00	1.53
14. V. c., cem. conc. sewer, 24 in.	244 l. f.	2.75	2.50	2.15
15. Bounds	29 ea.	6.00	6.00	5.00
16. Catch basins	21 ea.	70.00	65.00	66.50
17. Granite curb inlets	19 ea.	18.00	16.00	14.50
18. Riprap	14,000 lb.	1.75	1.50	1.43
19. Remove trees	14 ea.	20.00	13.00	13.00
20. Gravel	5,300 c. y.	.70	.60	.71
21. Sand borrow	400 c. y.	1.50	1.50	1.20
22. Strip gravel pits	530 c. y.	.20	.05	.10
23. Concrete, cl. A	6,100 c. y.	16.00	15.00	15.50
24. Stock fence	580 l. f.	.20	.20	.17
25. Granite curb, type B	3,480 l. f.	1.20	1.25	.93
26. Manholes	6 ea.	70.00	70.00	65.00
27. Fine grading	41,000 s. y.	.03	.04	.06
28. Reinf., structures	1,100,000 lb.	.035	.035	.0375
29. Bit. waterproofing	6,500 s. y.	.30	.30	.15
30. Dry stone masonry	10 c. y.	10.00	10.00	7.50
31. Granolithic walks	10 s. y.	2.50	3.00	1.75
32. Cobble stone gutter	90 s. y.	1.25	1.00	1.00
33. Trench excav.	10,300 c. y.	.80	1.00	.72
34. Clear, grub	4 acre	100.00	100.00	75.00
35. Channel excav	300 c. y.	1.00	1.00	.50
36. Loam borrow	610 c. y.	1.50	1.00	.95
37. Trench ledge excav	150 c. y.	5.00	7.00	2.00
38. Reinf. conc. pipe, 24 in.	400 l. f.	3.00	3.00	2.80
39. Reinf. conc. pipe, 36 in.	60 l. f.	6.50	6.00	4.75
40. Reinf. conc. pipe, 42 in.	120 l. f.	8.00	8.00	6.40
41. C. I. culvert, 24 in.	24 l. f.	6.50	7.00	5.52
42. Corr. metal pipe, 42 in.	126 l. f.	8.00	9.00	6.90
43. Special manholes	4 ea.	150.00	100.00	400.00
44. Trench excav., over 8 ft.	700 c. y.	1.75	1.50	4.30
45. Spec. guard rail	2,850 l. f.	1.25	.90	.85
46. Concrete guard posts	33 ea.	3.50	3.00	2.00
47. Str. granite curb, A, 6x20 in.	80 l. f.	1.65	1.50	1.36
48. Curv. granite curb, type B	450 l. f.	1.50	1.75	1.31
49. Granite curb corners	20 ea.	8.00	8.00	4.75
50. Field sodding	10,600 s. y.	.50	.90	.90
51. Lawn sodding	5,400 s. y.	.60	1.00	1.35
52. Seeding	3,100 s. y.	.06	.10	.07
53. Pea stone, drives	10 ton	2.00	2.00	1.95
54. Bit. conc. sidewalk, cl. 1	60 ton	7.50	7.00	7.40
55. Stone base, sidewalks	70 c. y.	4.50	3.50	3.50
56. Asphalt base, sidewalks	1,500 gal.	.12	.12	.12
57. Broken stone road top	1,070 c. y.	4.00	4.00	2.80
58. Asphalt mac. road top	37,000 gal.	.12	.12	.11
59. Remove, stack orn. fence.	75 l. f.	.25	.20	.10
60. Remove, reset orn. fence	95 l. f.	.50	.50	.30
61. Remove, stack stone curb	40 l. f.	.50	.50	.25
62. Remove, reset riprap	15 c. y.	3.50	2.00	2.00
63. Cinder borrow	5,000 c. y.	1.25	1.00	.75
64. Gravel, cofferdams	800 c. y.	2.75	1.50	1.05
65. Broken stone fill	600 c. y.	2.50	3.00	1.95
66. W. i. drain pipe, 6 in.	660 l. f.	3.50	3.00	3.66
67. C. i. water pipe, 6 in.	70 l. f	1.50	1.50	1.40
68. C. i. water pipe, 10 in.	190 l. f.	2.50	2.50	2.40
69. C. i. water pipe, 12 in.	50 l. f.	3.00	4.00	3.25
70. Timber pile tests	10 ea.	100.00	200.00	200.00
71. Timber piles, under 25 l. f.	11,000 l. f.	.40	.58	.47
72. Timber piles, 25–35 l. f.	2,000 l. f.	.40	.58	.47
73. Timber piles, 35–45 l. f.	36,000 l. f.	.40	.58	.32
74. Timber piles, 45–55 l. f.	14,000 l. f.	.50	.58	.29
75. Timber piles, 55–65 l. f.	2,000 l. f.	.50	.58	.43
76. Timber piles, 65–75 l. f.	2,000 l. f.	.50	.58	.43
77. Timber piles, 75 l. f. plus.	34,000 l. f.	.50	.58	.56
78. Composite pile tests	10 ea.	100.00	300.00	300.00
79. Composite piles, to 80 l. f.	21,300 l. f.	1.60	1.60	1.69
80. Composite piles, 80–90 l. f.	11,800 l. f.	1.60	1.60	1.69
81. Composite piles, 90–100 l. f.	2,200 l. f.	1.90	1.60	1.69
82 Composite pies, 100 l. f. plus	13,500 l. f.	1.90	1.60	1.69
83. Sawed face granite mas.	13,300 s. f	3.25	3.00	4.21
84. Six cut granite mas	7,300 s. f.	4.00	4.00	5.42
85. Rough point granite mas.	1,100 s. f.	7.00	6.00	9.32
86. Carved granite orn	16 ea.	500.00	500.00	880.00
87. Cofferdam	l. s.	69,000.00	87,000.00	129,000.00
88. Struc. carbon steel	4,750,000 lb.	.0675	.067	.0663
89. Struc. silicon steel	1,410,000 lb.	.075	.0735	.073
90. Steel sheet piles	100,000 lb.	.03	.03	.025
91. Zinc plates	5,250 lb.	.25	.25	.20
92. Steel bridge railing	2,450 l. f.	7.00	8.00	7.50
93. Rock fill	7,500 ton	2.00	3.00	2.00
94. Cement waterproofing	170 s. y.	4.00	4.00	4.00
95. Bit. conc surface, l. l.	800 ton	7.50	7.00	6.90
96. Traffic markers	2,160 s. f.	.75	.25	.73
97. Remove exist. structures	L. S.	23,000.00	25,000.00	22,000.00
98. Lighting system	L. S.	7,000.00	7,200.00	7,500.00
99. Iron work	L. S.	1,000.00	1,000.00	855.00
100. Aluminum exp. joint shields	350 lb.	1.20	1.25	1.50
101. Copper gutters	1,700 lb.	.75	.50	.80
102. Scuppers	24 ea.	25.00	15.00	12.60
103. Access manholes	4 ea.	50.00	50.00	48.00
104. Telephone manholes	2 ea.	35.00	50.00	10.00
105. Bronze doors	2 ea.	500.00	450.00	445.00
103. Snow disposal manholes	5 ea.	75.00	100.00	70.00

SUBWAY ALTERATIONS, N. Y.

OWNER: Board of Transportation, City of New York; Jesse B. Snow, Chief Engr.

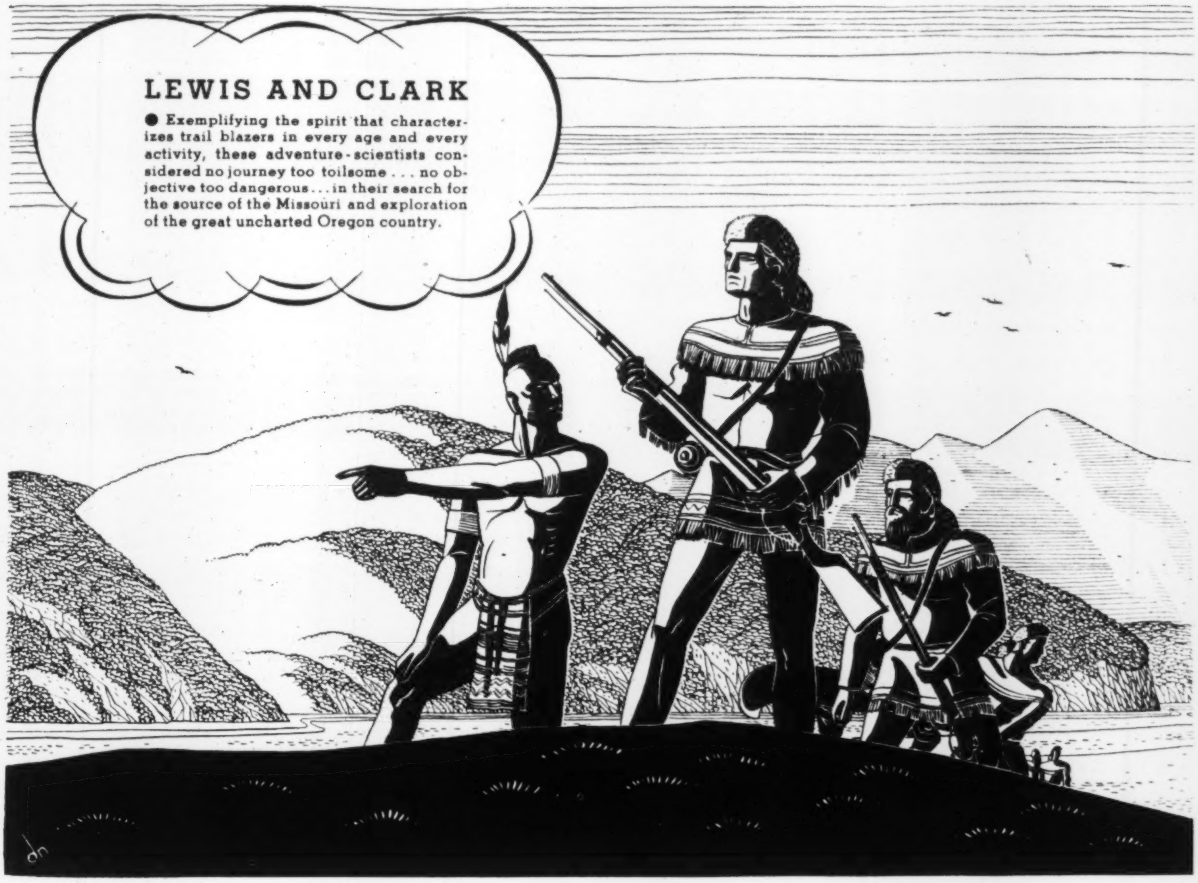
PROJECT: Structure and track changes at the Queens Plaza-Steinway Tunnel line in Queens, New York, N. Y. for the City owned subway system.

BIDS: Four bids were opened in October, 1937, ranging from the contract low of $248,899 to $323,991, with the owners furnishing the rail for type III track, and the laying of the main rail track. Minimum hourly wage rates are stipulated of $1.75 for skilled and 68$\frac{3}{4}$c. for common labor.

LOW BIDDERS:

1. Centaur Construction Co., New York (contract)	$248,899
2. B. T. & J. J. Mack, Inc., New York	257,417
3. Bethlehem Steel Co., New York	282.135

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clearing	4 acre	$85.00	$50.00	$150.00
2. Embankment	35,000 c.y.	.16	.30	.25
3. Excavation	20,000 c.y.	.26	.50	.25
4. Ballast	7,000 c.y.	2.17	3.00	2.50
5. Remove old tramway	800 l. f.	1.00	3.00	2.50
6. Piles, Douglas fir, 12-16 in.	82,000 l. f.	.48	.50	.60
7. Piles, cutoff, 12-16 in.	4,500 l. f.	.16	.167	.20
8. Piles, Douglas fir, 10-14 in.	62,000 l. f.	.53	.50	.60
9. Lumber, Douglas fir	2,170 M.b.m.	39.00	50.00	60.00
10. Bolts, drift	54,000 lb.	.035	.05	.05
11. Bolts and washers	62,000 lb.	.05	.07	.07
12. Spikes, ship, wire	46,000 lb.	.045	.06	.07
13. Spikes, railroad	52,000 lb.	.04	.06	.05
14. Rails, steel, 75-lb. relay	700 ton	50.00	45.00	50.00
15. Frogs, switches, guard rail	9 set	215.00	200.00	300.00
16. Cable, wire, $\frac{5}{8}$ in. plus	43,000 l. f.	.025	.05	.05
17. Straps, steel	16,000 lb.	.05	.06	.06
18. Tie plates	20,000 lb.	.03	.06	.06
19. Anti-rail creepers	7,300 ea.	.32	.40	.40
20. Metal pile shoes	1,260 ea.	1.70	1.50	1.40
21. Stone	470,000 ton	1.93	1.85	2.35
22. Concrete	1,700 c.y.	17.25	25.00	22.00
23. Concrete anchor chains	12,000 lb.	.19	.25	.27
24. Install track scales	L.S.	2,750.00	1,000.00	3,250.00



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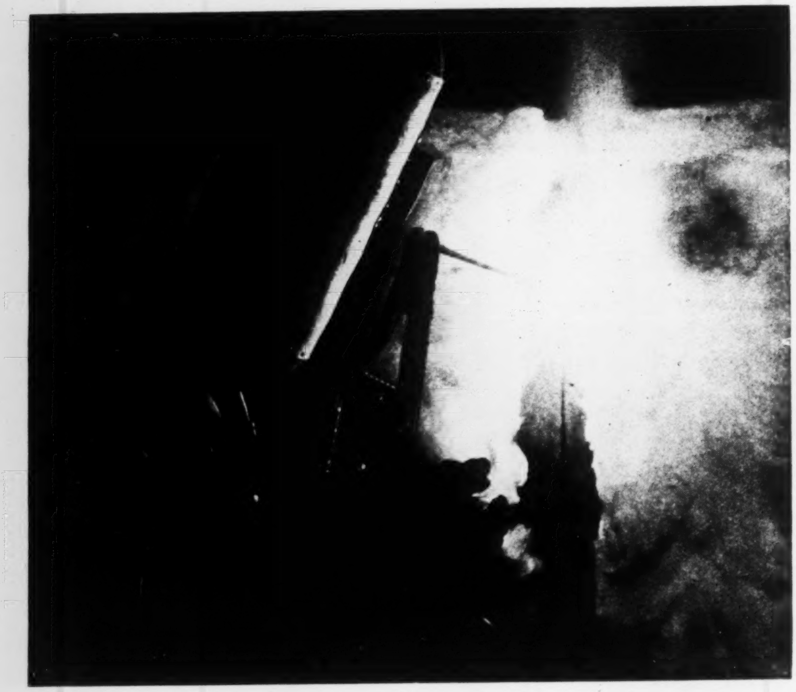
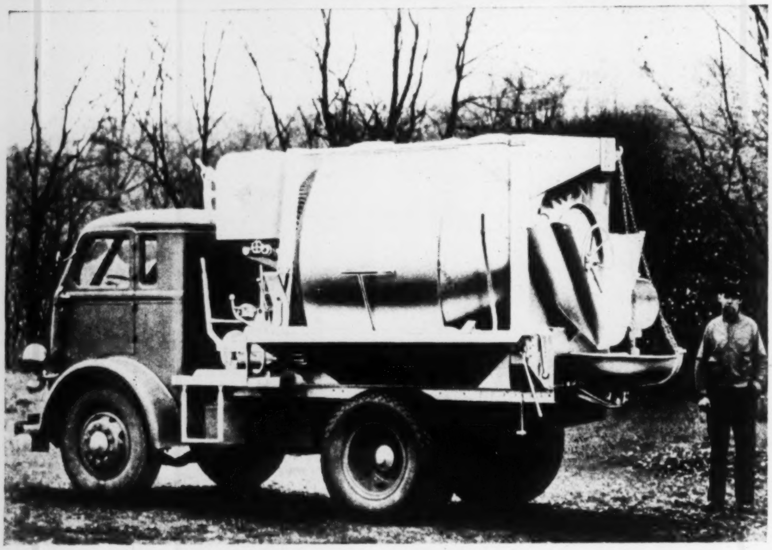




New Trukmixers

A series of $3\frac{1}{2}$- and 4-cu.yd.. Trukmixers has been added by Blaw-Knox Co., Pittsburgh, to their line of concrete mixing trucks. In these new trucks, manganese alloy steel has been used for the mixing drums and the mixing blades to provide increased abrasion resistance. The blades themselves have been made deeper.

Accuracy of water measurement has been improved by provision of a dual system; water may be automatically measured into a mixer by adjustable overflow from a full water tank, or the amount of water required for the batch may be automatically measured into the tank. A patented overflow arrangement eliminates errors arising from splashing or inaccurate measurement on a slope.

Pre-Heating Equipment For Pipe Welding

An electric pre-heater, for use on alloy pipes before welding, which has recently been developed by Detroit Electric Furnace Co., of Detroit, is said to combine speed of installation, simplicity of operation, low maintenance cost, and accurate temperature measurement. It can be used to pre-heat pipes before welding and during the welding operation without manual adjustment of the heating elements, and any temperature up to 600 deg. F. can be maintained during the welding operation.

Two insulating blankets insulate the heating apparatus from the welder during the weld, while the pre-heater is still in operation.

The equipment consists of an indicating pyrometer, a two-heat switch, and an arrangement of adjustable heating elements in a connecting linkage which holds them in direct contact with the pipe, and also the insulating blanket. The equipment is designed for operation on any 220-volt, single phase power line. The heaters are arranged to heat a distance of about 4 in. on either side of the weld to whatever temperature is determined on by the operator.

The apparatus, which has a power consumption of about 30 kw. is available in two sizes, one for pipe sizes up to a maximum of 14 in., and a second to handle pipe up to 24 in.

EQUIPMENT IN BRIEF

A Portable scraper conveyor with hydraulic control is being marketed by The Jeffrey Manufacturing Co., of Columbus, Ohio. It is built in three lengths, 25 ft., 30 ft. and 35 ft., with electric or gasoline power and either plain or self-propelled.

A Typewriter ribbon for use in typing material which is to be reproduced by photographic or blueprinting processes and which is said to give typing more opaque than that given by ordinary ribbon is being manufactured by the Ozalid Corp. of New York City.

The Trackson High Shovel, equipped with a $\frac{3}{4}$-yd. bucket, has been made available for Caterpillar tractors R-4 and D-4. The High Shovel is a lifting digger and loader which will excavate in clay, gumbo or rocky soil, do stripping, leveling and subgrading, and charge conveyors, crushers and concrete mixers.

NEW PUBLICATIONS

It Takes nearly 40 pages of small type to list the rebuilt construction equipment available for rent in the E.C.A. warehouses at Chicago. They are listed in stock list No. 144.—Equipment Corp. of America, Chicago, Ill.

The 1938 Models of the 9-inch "Workshop" lathes, which are recommended for repair shops and laboratories by the manufacturer, are described along with lathe accessories in Catalog No. 46.—South Bend Lathe Works, South Bend, Ind.

Properties of Amercoat plastic coatings are described in an 8-page pamphlet.—American Concrete & Steel Pipe Co., Los Angeles, Cal.

Catalog No. 6, a handsomely put together 100-page ring-bound booklet, attractively catalogs Friez standard weather instruments—Julian P. Friez & Sons, Inc., Baltimore, Md.

A Large Number of specific examples of economies achieved by changing from cast to welded design of products are followed in a 32-page pamphlet by suggestions for redesigning a number of typical machine parts. The booklet is entitled "How to Change Over to Welded Design for Profits."—The Lincoln Electric Co., Cleveland, Ohio.

"Dirt-Moving with International Trac-TracTors" is described in 30 pages of pictures.—International Harvester Co., Chicago.

The Fortieth Edition of Billings' catalog of forged tools especially features Billings' line of Vitalloy wrenches and carbon steel wrenches.—The Billings & Spencer Co., Hartford, Conn.

Factors involved in safe street lighting are described in a new pamphlet "Safety with Light." An interesting series of pictures show night street scenes before and after redesign of lighting, and the changes made are described in the captions.—Westinghouse Electric & Mfg. Co., Edgewater Park, Lighting Division, Cleveland.

Operating Data gathered in the field on a multitude of commercial operations using Hardinge ball mills are tabulated in the 12-page Bulletin No. 41.—Hardinge Co., York, Penna.

Electrical characteristics of fractional horsepower motors and a description of several types of these motors produced by Century Electric Co. are included in a new booklet "Century Fractional Horsepower Motors." —Century Electric Co., St. Louis.

"How to Handle Loads Safely" is a description of properties and types of Macwhyte wire rope slings. — Macwhyte Co., Kenosha, Wis.

A New Benjamin catalog, No. 26, lists lighting and signalling equipment and fittings. Bound in loose-leaf form, it has 289 pages and a 36 page index. —Benjamin Electric Mfg. Co., Des Plaines, Ill.

Hays draft gages and combustion meters are described in two new publications, No. 37-294 and 37-297.—The Hays Corp., Michigan City, Ind.

Virtues of the Hunter safety railing are described and illustrated in a 16 page ring-bound pamphlet. — Hunter Steel Co., Neville Island, Pittsburgh.

Floodlight projectors are listed with relevant data in a new Pyle-National catalog No. 211.—The Pyle-National Co., Chicago.

A Brief Catalog of test boring tools, Bulletin No. 20, describes Acker earth augers, core drills, and accessories.—Acker Drill Co., Scranton, Pa.

A New Catalog of industrial thermometers, No. 1125-B, occupies 25 pages. — C. J. Tagliabue Mfg. Co., Brooklyn, N. Y.

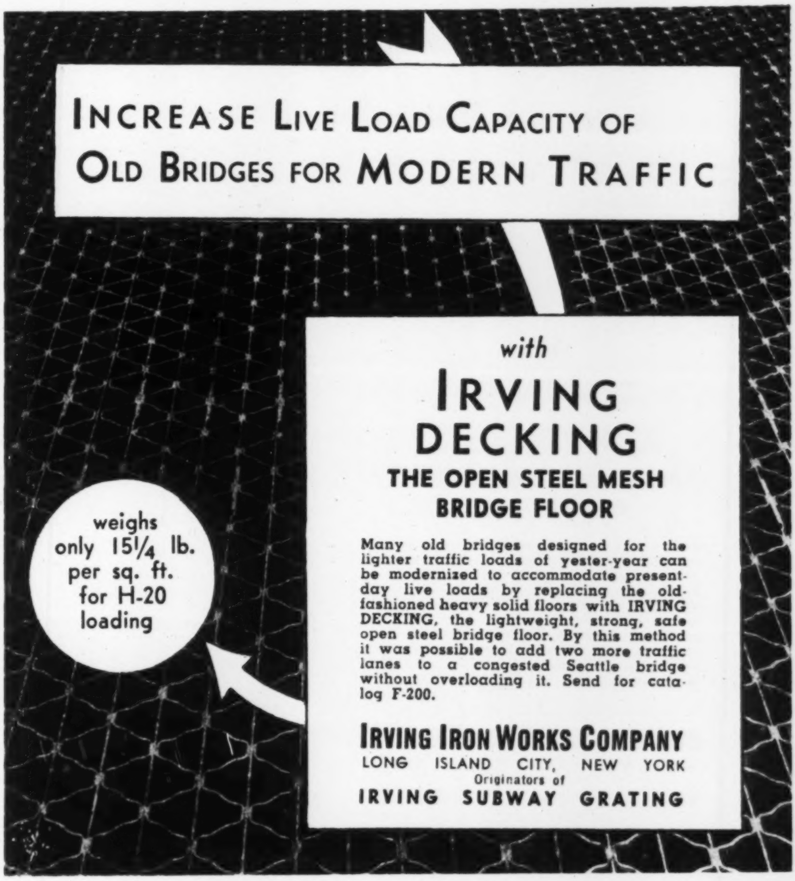
When Heltzel says portable, Heltzel means portable, asserts the cover of a new catalog of portable batching plants, bulletin S-18-B.—Heltzel Steel Form & Iron Co., Warren, Ohio.

International Nickel has issued a list of current free publications on nickel alloys together with a handy order form.—The International Nickel Co., Inc., New York City.

Appropriate to the season comes an attractive 70-page catalog of Champion snow plows.—Good Roads Machinery Corp., Kennett Square, Penna.

One Hundred and One photographs illustrate as many uses of wrought iron in a new 32-page Byers booklet, "101 Uses for Wrought Iron."—A. M. Byers Co., Pittsburgh.

Temperature instruments for the steam plant are described and methods of measurement are explained in Leeds & Northrup's Catalog N-33-163.—Leeds & Northrup Co. Philadelphia.



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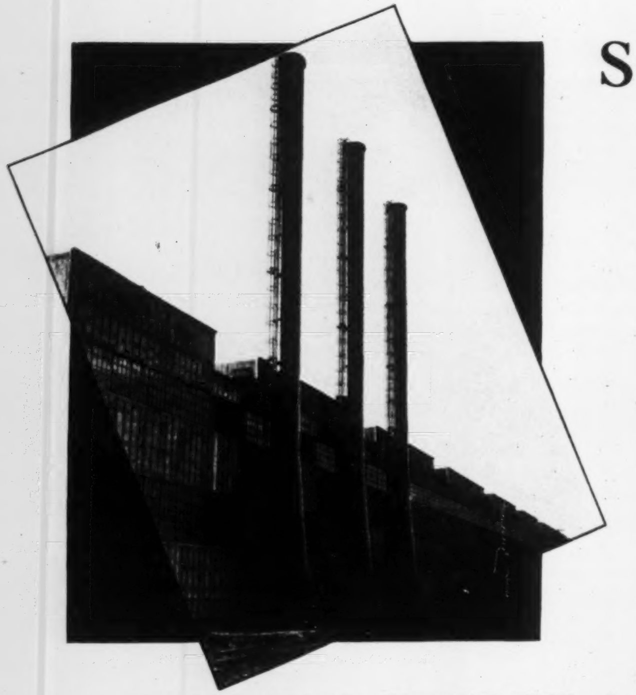

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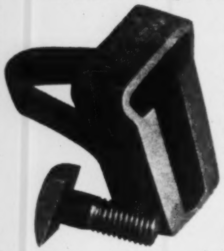

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CONSTRUCTION REPORTS

Engineering and building projects by stage of progress and type reported by ENR correspondents

Construction projects reported in these pages covering the United States and Canada, are of these designated sizes: water supply, earthwork, waterways, $15,000 and over; other public works, $25,000 and over; industrial buildings, $40,000 and over; other buildings, $150,000 and over; covering foreign construction, $500,000 and over.

They are classified in the following groups, named in the order of their publication: Water Supply . . . Sewers, Waste Disposal . . . Bridges, Grade Crossings . . . Streets and Roads . . . Earthwork, Waterways . . . Unclassified . . . Materials, Equipment . . . Reports from Abroad . . . Public Buildings . . . Commercial Buildings . . . Industrial Buildings.

They are reported in these stages: proposed (except Streets and Roads); bids asked; low bidders (projects of $500,000 and over); contracts awarded. Where a previous report has been carried the issue date is noted on the current report. In each stage reports are arranged in geographical order, first by state then by city or town.

Symbols and abbreviations include:

✦ Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD McGraw-Hill Construction Daily

WATER SUPPLY

PROPOSED WORK

Ga., Marietta—Cobb Co., c/o C. M. Head, comr., and R. L. Osborne, secy., approved preliminary surveys plans constructing 8 mi. 8 in. c.i. mains from Chattahoochee River to Marietta to serve approximately 400 customers, mains to feed from reservoirs at Smyrna and Marietta. $140,000. J. B. McCrary Co., 22 Marietta St., Atlanta, engr.

Ind., Muncie—Municipality plans constructing waterworks system. To exceed $25,000. C. Hurd, Architects & Builders Bldg., Indianapolis, engr.

Ia., Des Moines—Bd. Supervs. Polk Co., adopted a resolution authorizing application for a W.P.A. project to further the construction of water district in Fort Des Moines, a suburb of here. $31,000 of which government will provide $13,000 in labor and materials, the remaining $18,000 will be by assessment against benefitted property owners in the district. Water to be supplied from Des Moines water system.

Mo., Butler — City, H. B. Overweather, mayor, preliminary surveys constructing earth dam with concrete spillway to impound water for city supply. $30,000. Black & Veatch, 4706 Bway., Kansas City, Mo., engrs.

N. Y., Eastchester—New Rochelle Water Co., 29 College Pl., New Rochelle, plans constructing underground water tank and pumper at Wilmont and Webster Rds., in Green Knolls Area. To exceed $15,000. Private plans. Applied for permission to install at once.

Okla., Davis—City, preliminary plans water main extensions. $10,000. Engineer not appointed.

★**Okla., Tulsa** — City defeated bonds for water main extensions. $600,000. M. C. Shibley, city engr. Noted Nov. 18, C.D.—Nov. 25, E.N.-R.

Tex., Atlanta—City, c/o Secretary, voted $50,000 bonds to finance construction waterworks system. H. J. Von Zuben, 1013 Electric Bldg., Fort Worth, engr. Noted Nov. 24, C.D.—Dec. 2. E.N.-R.

Que., Megantic—Municipality making plans constructing water pumping plant. $30,000. C. Ricard, Town Hall, engr.

BIDS ASKED

Ariz., Globe—See "Contracts Awarded."

Ky., Louisville—Jan. 10, by Louisville Water Co., 435 South 3rd St., constructing Sect. 2, four 15 M.G.D. 200 ft. head vertical shaft, electrically driven pump units erected with appurtenances on River Pumping Station. Sect. 4, four 24 in. automatic cone valves. Sect. 5, one motor driven drainage pump and two vertical shaft, electric driven drainage pumps. Sect. 6, building alterations, incl. flood doors and other miscellaneous work. Sect. 7, earth filling, 18,000 cu. yd. L. S. Vance, 435 South 3rd St., engr. in charge. Noted Aug. 23, C.D.—Aug. 26, E.N.-R.

★**Minn., St. Paul** — Jan. 4, by City, constructing filter plant. $600,000. L. N. Thompson, supt. and engr.

Minn., St. Paul — Jan. 4, by City, Bd. Water Comrs., City Hall, constructing filtration plant addition, Unit No. 2, excavating, pile cutoffs, rein.-con. footings, protection of excavated areas, etc., at McCarron's Pumping Station. $33,000. P.W.A. project. G. M. Shepard, city engr.

N. J., Newark—See "Contracts Awarded."

N. J., New Brunswick—See "Contracts Awarded."

N. Y., Buffalo—See "Contracts Awarded."

N. Y., Flushing—Jan. 4, by New York World's Fair, 1939, Inc., Empire State Bldg., 350 5th Ave., New York, constructing 29,000 lin. ft. water mains, sewers and drains, Sect. 1, east of Flushing River, incl. corrugated metal pipe, concrete pipe, vitr. tile pipe, c.i. pipe, asbestos cement pressure pipe, steel manholes, storm water inlets, fittings, valves, boxes, covers, hydrants, excavation, etc.

Okla., Bristow—See "Contracts Awarded."

Okla., Heavener—See "Contracts Awarded."

Okla., Mangum—See "Contracts Awarded."

Okla., Roff—See "Contracts Awarded."

Wash., Buckley—See "Contracts Awarded."

Wash., South Bend — Jan. 10, by Pacific County Public Utilities Dist. 1, drilling well, 300 ft. deep and 6 in. in diam. $3,000. At a later date, turbine motor-driven pump will be installed and distribution lines built to serve 50 customers. R. E. Towne, Perkins B'dg., Tacoma, engr.

Wash., Steilacoom — See "Contracts Awarded."

W. Va., Fairmont — See "Contracts Awarded."

Wis., Milwaukee—Jan. 6, by Dpt. P. Wks., constructing several underground lines for water purification plant. $48,000. P.W.A. project. R. E. Stoelting, comr.

CONTRACTS AWARDED

Ala., Cullman—Town, constructing complete new water supply from Mulberry Fork of Warrior River, to R. J. Reid Contg. Co., 2109 North 14th St., Birmingham. Est. **$220,000.** Polglaze & Basenberg, Webb Crawford Bldg., Birmingham, engrs. Bids Nov. 22. Noted Nov. 19, C.D.—Nov. 25, E.N.-R.

Ariz., Globe—City, laying new city water pipe, **W.P.A.** labor, **$18,000.**. W. A. Sullivan, mayor. Approved in Wash., D. C.

Calif., San Francisco—P. Utilities Comn., City Hall, laying c.i. watermains in 19th Ave. between Taraval and Wamona Sts., involving 2,000 lin. ft. excav. and backfill, installing 8 in. pipe, 4,500 lb. fittings, valves, etc., replacing pavement, etc., to W. J. Tobin, 3701 Balfour Ave., Oakland, **$1,162.** Bids Dec. 15. City to furnish necessary pipe and valves, fittings. Noted Dec. 7, C.D.

Calif., San Francisco—San Francisco Bay Exposition, Inc., 585 Bush St., constructing 20 in. watermain and appurtenances on Causeway between Yerba Buena Island and World's Fair Exposition site on "Treasure Island," in San Francisco Bay, to W. J. Tobin, 3701 Balfour Ave., Oakland, **$4,870.** Noted Dec. 13, C.D.—Dec. 16, E.N.-R.

Ind., Elnora—Town Bd., W. H. Tomey, clk., furnishing 25,000 lin. ft. 2- to 8-in. "Transite" pipe, to Johns-Manville Co., 222 West North Bank St., Chicago, Ill. **W.P.A.** Bids Dec. 3, awarded Dec. 8. Noted Nov. 29, C.D.

Minn., Moose Lake — State Bd. Control, State Office Bldg., St. Paul, furnishing 1 deep-well pump at Fourth State Hospital, to R. K. Culbertson, 811 Wesley Temple Bldg., Minneapolis, **$2,268.** Bids Dec. 7. Noted Nov. 24, C.D.

Minn., St. Paul—City, H. W. Austin, city purch. agt., constructing Riverview Pumping Station, to W. M. Murphy & Son, 428 New York Bldg., **$32,945. P.W.A.** Bids Dec. 7.

N. H., North Haverhill—Comr. North Haverhill Water & Light Dist., constructing water supply system, c.i. pipe, pump house and equipment, to Anthony Ross & Son, 173 Bedford St., Lexington, Mass., **$46,370. P.W.A.** Bids Dec. 7, awarded Dec. 16. Noted Nov. 22, C.D.—Nov. 25, E.N.-R.

N. J., Howell—See "Public Buildings."

N. J., Newark—City, incasing with 4 in. cement mortar 4,500 ft. 16 in. and 4,390 ft. 12 in. watermain to prevent corrosion in Port Newark area, on Marsh, Port and Dock Sts., and Doremus Ave. **W.P.A.** labor. **$61,000.** Materials will be purchased by city. W. Bank, City Hall, engr.

N. J., New Brunswick—Town, general improvements and cleaning out of watershed, relief labor. **$83,000. W.P.A.** Materials will be purchased by owner. Mr. Atkinson, Town Hall, city engr.

N. Y., Buffalo—City, extending water mains in various sections, own forces. To exceed **$25,000.** Owner will supervise and purchase materials.

O., Akron—City, clearing reservoir site, to Varga & Anderson, Cleveland, **$8,936.** P.W.A.

O., Reynoldsburg—City, constructing new well,pump and pump house, to H. S. Carruthers, Groveport, **$3,065. P.W.A.** Bids Nov. 24.

Okla., Bristow—City, S. R. Grimes, mayor, constructing water-main extensions, **W.P.A.** labor, **$4,500.** Approved by W.P.A. W. B. McMasters, 1724 West 9th St., Oklahoma City, engr.

Okla., Heavener — City, constructing concrete dam on Cedar Creek. **W.P.A.** forces. **$20,000.** A. L. Nelson, Heavener, engr.

Okla., Mangum—City, constructing new dug water well and pumping equipment, **W.P.A.** labor. **$4,000.** J. R. Willip, Mangum, city engr.

Okla., Roff—City, constructing new pump house, reservoir, lower present mains and extending water lines. **W.P.A.** labor. **$16,000.** W. B. McMasters, 1724 West 9th St., Oklahoma City, engr.

Pa., Pittsburgh—City, F. M. Roessing, dir. Dpt. P. Wks., City-County Bldg., furnishing, erecting piping and appurtenances, to National Valve & Mfg. Co., Liberty Ave., **$34,961.**

Tex., Raymondville — Magnolia Petroleum Co., Corpus Christi, constructing 7 mi. 6 in. c.i. water pipe main from point below Raymondville to Arroyo, Colorado. Owner builds. Engineer, c/o owner, engr.

Wash., Buckley—City, improving reservoir site, **W.P.A.** labor. **$9,030.**

Wash., Steilacoom—City, improving water system, **W.P.A.** labor. **$4,495.**

W. Va., Fairmont—City, constructing project to furnish pure water to Monongah, Carolina and Idamay, towns near here. **W.P.A.** labor. **$50,000.**

Que., Montreal—Municipality, enlargement of Cote des Neiges Reservoir, to Atlas Constr. Co., Ltd., 679 Belmont Ave., **$327,000.** C. J. Desbaillets, 3161 Joseph St., Verdun, engr.

SEWERS, WASTE DISPOSAL

PROPOSED WORK

★**Colo., Pueblo**—Mayor rejected bids Dec. 15, new sewage disposal plant which was to have been operated on generated gases. P. West, Pueblo, public health comr. and G. Bull, P.W.A. engineer at Fort Worth, Tex., now conferring, in Fort Worth, Tex. City and P.W.A. have $500,000 for project. Expect 3 months delay to revise plans and take new bids to keep within limits of $450,000. Noted Nov. 16, C.D.—Nov. 18, E.N.-R.

Conn., East Hartford (br. Hartford)—Town, P. Wks. Dpt., Town Hall, plans sewage treatment plant. To exceed $25,000. Metcalf & Eddy, 1390 Statler Bldg., Boston, Mass., engrs.

★**Ind., Gary** — City plans constructing sewerage disposal plant. $500,000 or more. City Council, passed special ordinance ordering erection.

Kan., Topeka—City, W.P.A. allotments approved for constructing storm sewers East 8th St., $99,000. W. E. Baltry, city engr.

Mich., Grandville—Claude Berends, super Wyoming Twp., made application to W.P.A

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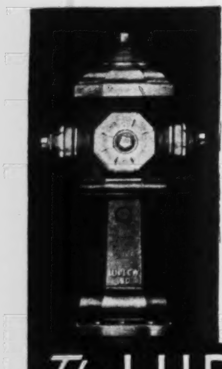

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Sewers, etc. (Continued)

dale territory known as the pumping area. $336,330. D. McCready, twp. engr.

N. Y., Celeron—Bd. Village Trustees, plans constructing sewage disposal plant and sewer system. $110,000. W. S. Lozier, Inc., 10 Gibbs St., Rochester, engrs. Special election in near future, to approve project and decide method of financing. Noted Sept. 27, C.D.—Sept. 30, E.N.-R.

N. Y., Falconer—Village plans constructing sewage treatment plant and pumping equipment. $88,386. Probably by W.P.A. labor. **Maturity in spring.** W. S. Lozier, Inc., 10 Gibbs St., Rochester, engrs. Noted June 18, C.D.—June 24, E.N.-R., under "Contracts Awarded."

N. Y., Mount Kisco—Village plans constructing sewage treatment plant. $175,000. State Dpt. Health, Albany, approved plans. **Maturity early in 1938.**

N. Y., Oneonta — City plans municipal garbage incinerator.

N. Y., Pleasantville—Village plans extending sewer lines in various streets. $70,000. **Maturity early 1938.** Plans approved by New York State Dpt. Health, Albany.

N. Y., Rochester—City Council plans constructing trunk sewer line to be built in Lexington Ave. Mount Read Blvd. area. $350,000. City Council to vote on project Dec. 27. W.P.A. labor.

N. Y., Troy—City plans constructing sewage disposal plant. To exceed $100,000. **Maturity indefinite.** C. F. Crowley, city engr.

N. Y., White Plains—City plans extending sewer lines in various streets. $73,000. **Maturity early in 1938.** Plans officially approved by State Dpt. Health.

N. Y., Yonkers—Common Council, City Hall, plans constructing about 1,000 lin. ft. house sewers in Raymond Pl. and vicinity. To exceed $25,000. **Maturity in near future.** C. Sheridan, city engr.

★**N. Y., Utica** — City plans constructing municipal sewage disposal plant. $750,000. J. B. Shaw, City Hall, engr. Owner plans to complete project before 1940, when their permit from New York State Dpt. Health, Bureau of Sanitation to discharge sewage into Mohawk River expires. City Council has ordered city engineer to commence preliminary engineering work on project.

O., Cleveland—City completed plans constructing 2,800 lin. ft. brick sewer in West 11th St. from Schaaf St. to Spring Rd. R. Hoffmann, City Hall, engr.

O., Cleveland—City making plans constructing grease catchers, piping and blowers for Westerly Sewage Plant. $75,000. Gascoigne Associates, Leader Bldg., engrs.

O., Dayton—Montgomery Co. plans installing 24- to 30-in. iron pipe sewage siphon line under Miami River south of here to transport sanitary sewage to disposal plant. $25,000. C. Bauer, Court House, co. sanitary engr.

Okla., Ada—E. H. Moore Co., Tulsa, soon lets contract furnishing 105,900 ft. 4- to 12-in. vitr. clay salt water brine disposal system in Fittstown oil field. $200,000. V. H. Cochrane, Tulsa, engr.

Okla., Sand Springs—Sand Springs Stock Yards, made preliminary plans constructing 7,000 ft., 15 in. rein.-con. sewer from plant to Arkansas River. $27,000. Private plans.

Ore., Klamath Falls—Village voters at special election authorized $124,700 bond issues, incl. $63,000 for sewerage, $7,000 for sewage chlorination plant, $7,000 for changing course of canal.

★**Pa., Pittsburgh**—City, F. M. Roessing, dir. Dpt. P. Wks., City County Bldg., plans nearing completion for sewerage system. $550,000. J. J. Croak, City County Bldg., city engr.

★**Pa., Uniontown**—City preliminary plans completed for disposal plant and 5 mi. sewers. $600,000. Chester Engineers, Century Bldg., Pittsburgh., engrs.

Tex., Atlanta—City, c/o Secretary, voted $40,000 bonds to finance construction sanitary sewerage system. H. J. Von Zuben, 1013 Electric Bldg., Fort Worth, engr. Noted Nov. 24, C.D.—Dec. 2, E.N.-R., under "Waterworks."

Tex., San Angelo—City plans sewer improvements, incl. extensions to sewage treatment plant, Imhoff tank, etc. J. P. Burden, San Angelo, engr. W.P.A. checking prior to calling for bids. (**Correction** — **Location of project.**) Noted Dec. 21, C.D.

Ont., Ottawa—Secretary Bd. Control takes bids early in 1938 constructing new sewers in Bronson Ave. from Arlington St. to Imperial Ave. $14,320; Percy St. from Arlington to Catherine Sts. $4,150; Catherine St. from Percy to Bronson Sts. $11,770; Henderson Ave. from Templeton to Main Aves. $7,800; Main Ave. from Henderson to Nicholas Ave. $5,090; Bayview Rd. from Siddell to Stonehurst Sts. $3,220; Grange Ave. from Scott St. southerly $3,930; Caroline Ave. from Scott St. to Spencer Ave. $9,310; Water St. from King Edward Ave. easterly $2,270; Stewart St. from Chapel to Friel Sts. $4,3 Stewart St. from Walker to Cumberland St. $3,020; Stewart St. from Augusta to Cobur Sts. $3,160; Daly Ave. from King Edwa Ave. to Nelson St. $3,560; Wilbrod St. fro Nelson to Friel St. $3,310. Total $79,02 F. C. Askwith, City Hall, engr.

BIDS ASKED

†**Calif., Sacramento**—Jan. 27, by Con. Q.M. Sacramento, constructing 3-ton U. S. Army standard natural draft incinerator a Sacramento Air Depot, Invitation 6870-38-1

Conn., Greenwich—Jan. 14, by E. S. Loughlin, first selectman, Town Hall, refuse incinerator, 150 ton capacity in 24 hours, back-in, storage-bin, crane feed type, $165,000 available. P.W.A. project. S. E. Minor & Co., Inc., Smith Bldg., engrs.; adv. E.N.-R. Dec. 30. Noted Sept. 20, C.D.—Sept. 23, E.N.-R.

Mich., Detroit—Jan. 4, by W. M. Walker, Jr., comr. Purchases & Supplies, 735 Randolph St., furnishing, delivering 4,600 volt switchgear, 4,600 volt reactors, 4,600 volt synchronous motor field rheostats and control switchboards for sewage treatment plant, P.W.A. 9602-R, for West Jefferson Ave. and River Rouge Sewage Disposal Plant.

Mich., Detroit—Jan. 18, by Dpt. P. Wks., constructing sludge filter and incinerator building and related works for sewage treatment plant to be located on West Jefferson Ave., River Rouge, Contr. TW-21, P.W.A. Project Docket 9602-R. L. G. Lenhardt, comr. P. Wks. G. R. Thompson, city engr.

Neb., Decatur—See "Contracts Awarded."

Neb., Lincoln—See "Contracts Awarded."

N. J., Elizabeth—See "Contracts Awarded."

N. Y., Brighton and **Penfield**—See "Contracts Awarded."

N. Y., Endicott—See "Contracts Awarded."

N. Y., Lockport—See "Contracts Awarded."

N. Y., Rochester—See "Contracts Awarded."

Okla., Bristow—See "Contracts Awarded."

Tenn., Memphis—Jan. 4, by City Comn., constructing Front St. intercepting sewer section from Poplar St. to McCall Pl. Black & Veatch, 4706 Bway., Kansas City, Mo., engrs. Noted Dec. 22, C.D., under "Low Bidders."

Wash., Tacoma—See "Contracts Awarded."

Que., St. Jerome—See "Contracts Awarded."

LOW BIDDERS

N. Y., College Point (br. Flushing)—Dpt. Sanitation, 125 Worth St., New York, Dec. 23, constructing College Point intercepting sewers from Tallmans Island Sewage Treatment Works to 25th Ave., Queens Boro, from Luang Constr. Co., East 54th St. and Avenue U, Brooklyn, $448,139. Noted Dec. 14, C.D.—Dec. 16, E.N.-R.

★**N. Y., New York**—Dpt. Sanitation, 125 Worth St., Dec. 21 constructing pump and blower house at Tallmans Island Sewage Treatment Works, Contr. 3, from Caye Constr. Co., Inc., Clarkson Ave. and East 43rd St., Brooklyn, $1,278,390. Noted Dec. 17, C.D.—Dec. 23, E.N.-R.

★**Tenn., Memphis**—City Comn., constructing Front St. intercepting sewer sect. from Poplar North to Saffrans from Walsh and Wells, Inc., Security Bldg., St. Louis, Mo., $426,810***Sections from McCall Place South to Calhoun and from Calhoun to River Front at Georgia St. from Nolan Constr. Co., 14101 Plymouth St., $444,244 and $419,455. Bids Dec. 14. Noted Nov. 16, C.D.—Nov. 18, E.N.-R.

CONTRACTS AWARDED

Calif., Oakland—W. W. Chappell, city clk., constructing 552 lin. ft. double 84 in. rein.-con. storm sewer, concrete in walls, redwood in structure, incl. fill of existing ditch, to American Concrete & Steel Pipe Co., 19th Ave. and Estuary, about **$16,600.** Noted Dec. 14, C.D.—Dec. 16, E.N.-R.

Ind., Batesville—Bd. P. Wks., H. J. Johnson, clk., constructing sewage disposal plant, to W. L. Hailey & Co., Cotton States Bank Bldg., Nashville, Tenn., **$49,730;** sewer work, to J. Dehner, Inc., 1212 Clark St., Fort Wayne, **$109,000.** Est. $170,000. Subject to **P.W.A.** approval. Bids Dec. 17, awarded Dec. 18. Noted Dec. 8, C.D.

Ind., Salem—Bd. P. Wks., H. Hazelbaker, clk., constructing sewage treatment plant, to Thompson & Co., Mitchell, **$44,900.** Est. $60,000. Award subject to **P.W.A.** approval. Bids Dec. 16, awarded Dec. 16. Noted Dec. 8, C.D.

Ia., Belle Plaine—City Council, constructing intercepter sewer and disposal plant, to E. B. Spencer Constr. Co., Waterloo, **$59,402.** Est. $75,000. Bids Dec. 17. Noted Dec. 13, C.D.

Sewers, etc. (Continued)

Ia., Lime Springs—Town Council, constructing sewer, to S. Christensen, Cedar Rapids, **$24,054;** sewage disposal plant, to A. F. Mathis, Valley Junction, **$17,338. P.W.A.** Bids Dec. 13. Noted Nov. 26, C.D.—Dec. 2, E.N.-R.

Ia., Storm Lake—City, constructing sanitary sewers, to Gjellefald, Forest City, **$26,-212.** Est. $37,000. **P.W.A.** Bids Dec. 10. Noted Nov. 26, C.D.—Dec. 2, E.N.-R.

Md., Baltimore — Bd. Awards, Municipal Bldg., constructing two new primary settling tanks, Curtis Bay Sewage Treatment Works, to F. Angelozzi, 123 South High St., Baltimore, **$41,059.** Bids Dec. 8.

Minn., Duluth—City, pumping auxiliaries and connections for storm sewers, to T. E. Lounsberry & Son, 322½ East Superior St., **$46,883. P.W.A.** Bids Nov. 26. Noted Nov. 24, C.D.

Mo., East Prairie—City, constructing sanitary sewers and sewage disposal plant, to H. A. Grabbe Constr. Co., Alton, Ill., **$34,335.** Est. about $36,000. **P.W.A.** Bids Dec. 14. Noted Dec. 6, C.D.—Dec. 8, E.N.-R.

Neb., Decatur—City, constructing sewage disposal plant and sewers, **W.P.A.** labor. **$28,000.** W.P.A. allotment approved. G. H. Beal, Norfolk, dist. W.P.A. engr.

Neb., Lincoln — City, constructing storm sewers in 24th and Washington Sts. to 25th and Sumner Sts., Wodsdale Blvd. from 25th St. to Dedar Ave. **W.P.A.** labor. **$35,000.** W.P.A. allotment approved. D. L. Erickson, city engr.

Neb., Omaha—City, furnishing sewer pipe for West Omaha new sewer project, to Concrete Products & Material Co., 4520 Dodge St., Omaha, **$60,633.** Noted Oct. 11, C.D.—Oct. 14, E.N.-R.

N. J., Elizabeth—City, constructing outfall sewers by bulkheading pumps, cleaning out, etc., Alina St. and Fairmount Ave. to Newark Bay, relief labor, **$200,000. W.P.A.** Materials will be purchased by owner. M. Collins, City Hall, engr.

N. J., Woodbridge—Town, test borings for constructing 26,800 ft. 8- to 15-in. sewer mains, force main pumping station, etc., to Middlesex Concrete Dock Co., 39 State St., Perth Amboy, at **58c.** per ft. **P.W.A.** C. R. Davis, Town Hall, engr.

N. Y., Brighton and **Penfield**—E. L. Whelpley, Fairport, constructing storm and sanitary sewers, pavement, sidewalks in residential development in Ellison Park Heights, day labor, **$30,000** plus. L. Kohl, Inc., 16 State St., Rochester, engr. State Dpt. Health approved plans.

N. Y., Endicott—Village, constructing storm water sewers in Duane Ave. section to eliminate floods, by **W.P.A.** forces. To exceed **$25,000.** W.P.A. grant allotted. C. F. Hunt, Village Hall, engr.

N. Y., Lockport—City, constructing sewage disposal plant and intercepting sewer, **W.P.A.** labor. To exceed **$100,000. Maturity 1938.** Shoecraft, Druary & McNamee, Ann Arbor, Mich., engrs., will make surveys, plans and supervise construction. Noted Dec. 3, C.D.—Dec. 9, E.N.-R.

N. Y., Rochester—City, constructing 3,000 ft. 8 in. vitr. tile pipe in concrete cradle, sanitary sewer in Christian Ave., **W.P.A.** labor. **$25,000.** Owner and W.P.A. Engineers will supervise. Owner purchases materials.

N. Y., Rochester—City, constructing trunk sewer in St. Paul-Clifford vicinity, **W.P.A.** labor. Project requires tunneling through rock. **$445,000.** $172,832 allotted by W.P.A. Owner and W.P.A. will supervise and purchase materials.

O., Akron—City, constructing storm water sewer in Wilbeth Rd.-Kentucky Ave., to D. Nero Constr. Co., Guarantee Title Bldg., Cleveland, **$37,930.** Est. $40,000. **P.W.A.** Awarded Dec. 16. Noted Dec. 20, C.D.—Dec. 23, E.N.-R.

Okla., Bristow—City, constructing sanitary sewer extensions in various streets, **W.P.A.** forces. **$25,000.** Approved by W.P.A. W. B. McMasters, 1724 West 9th St., Oklahoma City, engr.

Okla., Yukon—City, constructing sanitary sewer extensions, **W.P.A.** labor. **$25,600;** 22,-000 ft. 6- to 10-in. concrete pipe, to E. W. Baker & Co., Bethany, **$3,640.** W. B. McMasters, Oklahoma City, engr.

Wash., Bellingham—City, constructing 47,-200 ft. 6- to 30-in. sanitary sewers, 22 flush tanks, 84 manholes, in Eureka Dist., to C. V. Wilder, C and Maple Sts., **$82,801.** Est. $103,048. Bids Dec. 13. J. M. Adams, city engr.

Wash., Tacoma—City, constructing storm sewers to drain area surrounding South 65th and 74th Sts., **W.P.A.** labor. **$50,272.** C. D. Forsbeck, city engr.

Que., St. Jerome—Municipality, sewers in various streets, day labor, **$40,000.** A. Latour, Town Hall, engr.

BRIDGES. GRADE CROSSINGS

PROPOSED WORK

Mo., St. Louis—See "Unclassified."

Neb., York—State Hy. Dpt., Lincoln, approved $28,100 bonds for constructing underpass. $150,000. A. C. Tilley, Lincoln, state engr.

N. Y., Crestwood (Tuckahoe P. O.)—Crestwood Plaza Assn., c/o Vilage Bd., Tuckahoe, plans constructing overhead crossing above New York Central R. R. tracks at Thomson St. To exceed $100,000. Public hearing on Jan. 10, to vote on proposal to submit application to Public Service Comn., Albany. Probably financed jointly by Village of Tuckahoe, Bd. Supervs. Westchester Co., White Plains, and New York Central R. R. Co.

N. Y., Fonda—Dpt. P. Wks., Albany, soon takes bids constructing steel, concrete bridge at west entrance at village over Cayadutta Creek, Montgomery Co. To exceed $25,000.

★**N. Y., Jamaica**—Dpt. Plant & Structures, Municipal Bldg., New York, plans lift span bridge over Jamaica Bay, at Cross Island Blvd. $5,120,000. Private plans.

O., Cleveland—City, C. B. Patterson, purch. agt., preliminary survey steel, concrete bridge, East 14th St. and Lakefront. $150,-000. J. M. Heffelfinger, 518 City Hall, engr. Noted Dec. 10, C.D.—Dec. 16, E.N.-R.

O., Cleveland—City, C. B. Patterson, purch. agt., preliminary plans repairing steel bridge, Kinsman Rd. To exceed $25,000. J. M. Heffelfinger, City Hall, engr.

Ore., Klamath Falls—Village voters at special election authorized $63,000 bond issue for canal bridges.

Pa., Scranton—City, City Hall, retained **A.** Burton Cohen, 1 Madison Ave., New York, to prepare plans and estimates of cost for repairs, alterations and improvements to Lackawanna Ave. Bridge and West Lackawanna Ave. Viaduct. To exceed $25,000. C. F. Schroeder, city engr.

Que., Rouyn—J. S. Bourgne, Minister Dpt. Roads, Quebec, bids early in 1938, constructing suspension bridge over Kenojevis River. Est. about $100,000.

BIDS ASKED

California—See "Roads."

California—Jan. 7, by State Hy. Engineer, 1365 Harbor Blvd., San Diego, constructing rein.-con. slab bridge, consisting of eight 22 ft. spans and two 7 ft. 6 in. spans on cast in place concrete pile bents, across Sweetwater River between National City and Chula Vista in Highland Ave., San Diego Co.

Illinois—Jan. 7, by State Dpt. P. Wks. & Buildings, Div. Hys., Springfield, constructing rein.-con. floor, parapet walls, etc., erecting structural steel, and fabricating and constructing structural steel and painting for steel truss and I-beam superstructure for bridge over Illinois River at Hennepin, Project 230B, Route 89, Sects. 119 D, E, F and P, Bureau and Putnam Counties; widening 2 rein.-con slab bridges north of Chatham, Route 4, Sect. G-B, Sagamon Co. E. Lieberman, ch. hy. engr.

Massachusetts—Jan. 4, by Commonwealth of Massachusetts, Dpt. P. Wks., W. F. Callahan, comr., 100 Nashua St., Boston, constructing extension to wood pile and timber bridge between Edgartown and Oak Bluffs.

New York—Jan. 4, by State Dpt. P. Wks., Albany, constructing 60 ft. plate girder bridge and bituminous paving 2.5 mi. Fonda Village Main St., Hy. 5667, RC 2501, Montgomery Co.; 52 ft. steel beam elimination structure, and bituminous macadam paving 0.45 mi. Buffalo-Cheektowaga County Rd., SS038-1, Erie Co.; 22 ft. concrete bridge and one 65 ft. bridge on Swartwood Crossing, Oswego Part 2, Hy. 5168, Hy. 5429, Waverly, R.C. 3933, Tioga Co.

Oklahoma — Jan. 11, by State Hy. Dpt., Capitol, Oklahoma City, constructing 3 span 102 ft. I-beam bridge on piers, at Shattuck, Ellis Co. $8,984; 8 span 240 ft. I-beam bridge at Red Rock, Noble Co. $20,578. V. T. Moon, Capitol, Oklahoma City, engr.

Miss., Greenwood—See "Roads."

Nevada—See "Roads."

New Jersey—Jan. 10, by E. D. Sterner, comr. State Hy. Dpt., Trenton, constructing bridge to carry the tracks of Lehigh Valley R. R. across Route 35 Extension, Sect. 12, in Woodbridge Twp., Middlesex Co., consisting three track railroad bridge of two spans steel, concrete, incl. 851 cu. yd. found. excav.

†**North Carolina**—See "Roads."

O., Toledo—Jan. 18, at office Commissioner Purchases & Supplies, Safety Bldg., reconstructing Fassett St. bridge over Maumee River between Piers 4 and 6, incl. rebuilding Pier 4 above water line, complete construction 2 new piers, incl. cofferdams, reconstruction and strengthening of Pier 6, approximately 900 cu. yd. concrete, constructing 3 new spans of continuous deck truss, except decking, approximately 300 tons steel. J. N. Edy, city mgr.; adv. E.N.-R. Dec. 30. Noted Sept. 24, C.D.—Sept. 30, E.N.-R.

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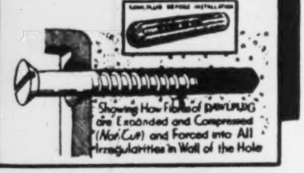
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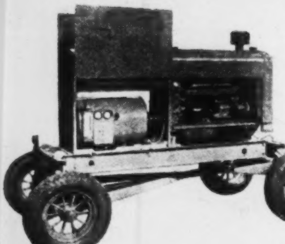

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Bridges, etc. (Continued)

O., Toledo—Jan. 4, by Comrs. Lucas Co., Court House, Items **(1)** 480 lin. ft. steel sheet piling for coffer dam **(2)** 1,740 cu. yd. found. excavating (wet) **(3)** 255 lin. ft. 12 in. water line in place. **(4)** 8,240 lin. ft. timber piles in place. **(5)** 208,000 lb. structural steel in place. **(6)** 20,272 lb. steel castings in place for Stickney Ave. bridge. $40,000. B. G. Kesting, Court House, co. engr. Noted Oct. 29, C.D.—Nov. 4, E.N.-R.

Virginia—See "Roads."

W. Va., Charleston — Jan. 6, by City, at office M. R. Mathews, city mgr., constructing bridge, steel superstructure on concrete substructure over Elk River at its mouth together with grading, draining, and paving approaches and improvement to and paving approach streets within corporate limits of Charleston. P.W.A. project. C. P. Forney, 208 Union Bldg., consult. engr.; adv. E.N.-R. Dec. 30.

LOW BIDDERS

★**N. Y., Bayville**—Bd. Supervs. Nassau Co., Mineola, reconstructing Bayville Bridge, from Andrew Weston Co., Woodmere, $512,-530. Noted Dec. 17, C.D.—Dec. 23, E.N.-R.

CONTRACTS AWARDED

Alabama—See "Roads."

Alabama—State Hy. Comn., Montgomery, constructing steel, concrete bridges on Thomasville-Selma Rd., FAP. 74, Wilcox and Marengo Counties, to J. S. Walton, Mobile. **$69,967.** Bids Aug. 6.

Calif., Los Angeles—Union Pacific R.R., B. H. Prater, ch. engr. System, 1416 Dodge St., Omaha, Neb., fabrication and erection of bridge steel for 3 span single track, through plate girder bridge, to American Bridge Co., 208 South LaSalle St., Chicago, Ill. Total est. about **$270,000.** Noted Nov. 4, C.D.—Nov. 11, E.N.-R., under "Contracts Awarded."

Calif., Modesto—C. C. Eastin, clk. Stanislaus Co., constructing bridge involving four 16 ft. spans, 20 ft. clear roadway, overall length 80 ft. and 125 cu. yd. rein.-con., over Modesto Irrigation Dist. Canal, in Reinway Ave., Stanislaus Co., to T. C. Tunsen, Route 1, Box 1360, Modesto, **$3,197.** Bids Dec. 14. Noted Nov. 29, C.D.—Dec. 2, E.N.-R.

Calif., Sonora—Supervs. Tuolume Co., Sonora., constructing I-beam and concrete bridge ovre Five Mile Creek, on Italian Bar Road, to Booker & Stephenson, P. O. Box 111, Jamestown, **$2,891.** Bids Dec. 7. Noted Nov. 22, C.D.—Nov. 25, E.N.-R.

Georgia—State Hy. Bd. Atlanta constructing detour bridge over Darien River on Brunswick-Savannah Rd., McIntosh Co., to Espy Paving & Constr. Co., Savannah, **$22,895***** bridge over Hard Labor Creek, Madison-Monroe Rd., Morgan Co., to Hardaway Constr. Co., Columbus, **$13,944*****bridge on Carrollton-Cedartown Rd., Haralson Co., to J. G. Attoway Constr. Co., Statesboro, **$34,840***bridge** over South River on road from Atlanta to S. R. 155, DeKalb Co., to J. R. Cothran, Jr., 3472 Piedmont Ave., Atlanta, **$16,917.** Grand total $88,596. Bids Dec. 17. Rejected bids Dec. 17, constructing bridge and approaches on Savanah-Brunswick Rd. at Seaboard Air Line Railroad, Chatham Co. Noted Dec. 7, C.D.—Dec. 9, E.N.-R., under "Roads."

Kansas—See "Roads."

New Jersey—E. D. Sterner, comr. Hy. Dpt., Trenton, constructing bridge to carry West Main St. across Route 4, Relocation, Sect. 37, Freehold, Monmouth Co., incl. two span steel, concrete bridge, 80 ft. with roadway width 40 ft. and two six ft. sidewalks, 620 cu. yd. found. excav., to Richards & Gaston, Somerville, **$28,567.** Bids Dec. 20. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

★**New York**—Triborough Bridge Authority, Administrative Bldg., Randalls Island, New York, general contract constructing bascule superstructure Contr. WB-18, and superstructure for Flushing River Bridge and approaches and Northern Blvd. Grade Separation, Contr. WB-19, for Bronx-Whitestone Bridge, to James Stewart & Co., 230 Park Ave., New York, **$769,950.** General contractor awarded 3,000 tons structural steel to Bethlehem Steel Co., Bethlehem, Pa. Noted Dec. 13, C.D.—Dec. 16, E.N.-R.

New York — Dpt. P. Wks., Albany, constructing bridge in Monroe Co., to John Petrossi Sons, Inc., McKee Rd., Rochester, **$57,798.** Est. $63,119. Bids Nov. 30. Withdrew bids to have been opened Nov. 30, bridge in Suffolk Co. Noted Nov. 12, C.D.—Nov. 18, E.N.-R.

New York—J. Petrossi & Sons, general contractors, McKee Rd., Rochester, 235 tons structural steel for bridge on Buffalo Rd., Monroe Co. for Dpt. P. Wks., Albany, to Genesee Bridge Co., West Ave., Rochester. Noted Dec. 22, C.D.—Dec. 30, E.N.-R., under "Contracts Awarded."

N. Y., Auburn—State Dpt. Correction, State Bldg., Albany, railroad bridge and tracks at Auburn State Prison, to Acme R. R. Constr. Co., 5309 Grant St., Cleveland, O., **$68,179.** Bids Dec. 14. Noted Nov. 18, C.D.—Nov. 25, E.N.-R.

★**Wisconsin**—State Hy. Comn., Madison, constructing structural steel superstructure for Mississippi River Bridge, on Sparta-La Crosse Rd., LaCrosse Co., to Klug & Smith Co., 111 East Wisconsin Ave., Milwaukee, **$509,621.** Bids Dec. 3. Noted Dec. 8, C.D.—Dec. 16, E.N.-R.

STREETS AND ROADS

BIDS ASKED

Illinois—Jan. 7, by Dpt. P. Wks. & Buildings, Div. Hys., Springfield, paving 0.8 mi. Chicago-Archer Ave. from 35th St. to Ashland Ave., F. A. 383G, Sect. 2525-1; 1.14 mi. Chicago-Archer Ave. from Ashland Ave. to Halstead St., F.A. 838E, Sect. 2626; 1.17 mi. Chicago-Archer Ave. from Halsted to State Sts., Project 383F, Sect. 2728, all foregoing Route SF.A. 133, Cook Co.; 11.27 mi. Havanna to Kilbourne Rd., Project 387B, F.A. 142, Mason Co.; 8.88 mi. Route 15, at Nashville South to Perry County line, 237D, F.A. 128, Sect. 9, Washington Co.; grading 3.65 mi. Gorham to Neunert R., F.A.S. Project 544A, S.A.P., 19A-1, Jackson Co.; concrete paving 0.61 mi. relocation U.S. 36 at Alexander, Route 10, Sect. 24X, Morgan Co. E. Liebermann, ch. hy. engr.

Ia., Clarinda—Jan. 27, by Page Co., G. F. Mitchell, aud., grading 5.038 mi. County Trunk Road C, Lincoln, Colfax, Harlan and Amity Twps., incl. 80,869 cu. yd. earth excav.; grading 3.2 mi. County Trunk Rd. in Douglas Twp., 62,559 cu. yd. excav. R. C. Brown, co. engr.

Kansas—Jan. 7, by State Hy. Comn. at office County Clerk, Burlington, concrete paving, earthwork, culverts, resurfacing, curbing, guttering 17.05 mi. hys. in Coffey, Elk and Labette Counties.

Louisiana—Jan. 12, by State Hy. Comn., Baton Rouge, grading, gravel or shell surfacing 2.534 mi. Intersection Routes 1082 and 32 Hy., Tangipahoa Parish; 3.977 mi. road between intersection Routes 70 and 182 Bossier Parish.

Miss., Greenwood—Jan. 11, by Chairman Bd. Supervs., La Flore Co., at office A. R. Bew, chancery clk., grading, drainage structures, bridges and rein.-con. paving 9.335 mi. roads, incl. 226,125 cu. yd. earth excav.; grading, drainage structures, concrete paving 9.485 mi. roads between Swifton and Morgan City, 111,707 cu. yd. earth excav. F. L. Abbott, Greenwood, engr.

Mo., St. Louis—See "Contracts Awarded."

Nevada—Jan. 5, by State Hy. Dpt., Carson City, constructing 1.7 mi. portion State Hy. System from Junction with State Route 3 to a point approximately 2 mi. west, Route 27, Sect. B, Washoe Co., constructing 0.79 mi. concrete, steel overpass and approaches on State Hy. System near Shoshone, Route 1, Sects. A1 and A2, Eureka Co. constructing 7.34 mi. portion of State Hy. System from Jean to Goodsprings, Route 53, Sect. A, Clark Co. R. A. Allen, hy. engr.

N. J., Orange—See "Contracts Awarded."

New York—Jan. 4, by State Dpt. P. Wks., Albany, penetration bituminous macadam paving 5.69 mi. North Greenfield to County Rd. 24, FAS SS 38-3, Saratoga Co.; 2.45 mi. Underhill Ave., FAS SS 38-2, Westchester Co.; preliminary grading, structures 4.7 mi. Glove Valley, Wingdale Rd., FAS SS 38-4, Dutchess Co.; concrete paving 7.34 mi. R. C. 3932, Clinton Co. F. S. Green, supt.

N. Y., Ballston Spa — See "Contracts Awarded."

N. Y., Delhi—See "Contracts Awarded."

N. Y., Herkimer—See "Contracts Awarded."

N. Y., Ogden—See "Contracts Awarded."

N. Y., Otsego—See "Contracts Awarded."

N. Y., Utica—See "Contracts Awarded."

†**North Carolina**—Jan. 20, by Public Roads, Dpt. Agriculture, 1725 F St., Wash., D. C., constructing 1.26 mi. road, incl. rein.-con. structure with stone facing, Project 2D3, Blue Ridge Parkway, Alleghany and Ashe Counties. H. J. Spelman, dist. engr.

Oklahoma—Jan. 11, by State Hy. Dpt., Oklahoma City, grading, paving 1.4 mi. approaches to South Canadian Bridge at Lexington U. S. Hy. 77, Cleveland Co. $121,507; roadside park south of Buffalo State Hy. 34, Harper Co. $3,635; U. S. Hy. 66, near Commerce, Ottawa Co. $4,284; grading, paving 2.07 mi. Hy. 69, Atoka Co. $62,873. Total $192,299. V. T. Moone, Capitol, Oklahoma City, engr.

Tex., Seguin—See "Contracts Awarded."

Virginia—Jan. 4, by State Hy. Dpt., Richmond, macadam surface treating and bridge 0.04 mi. Route 15, S.P. FA-51-CB1, Fed. Project FA-51, Loudoun Co.; macadam surface treating 3 mi. Route 29, S.P. FA-472-A2W, Fed. Project FA 379-A, Amherst Co.; rein.-con. paving 5 mi. Route 13, FA-180-BW2, 296 AW1, FS 180-B 303E, Northampton Co.; rein.-con., bituminous type paving 5.3 mi. Route 1, FA-358-AW3, FW2, DW4, 5, 6 FA-304-HCB; widening 44 ft. bridge Route 1, FA-358-GW1, FA-340G, Hanover Co.; rein.-con. paving 7.5 mi. Route 1, FA 649 EW2, 3, 4, CW2, DW1, AW2, W1, 271 AW5-440-

Streets and Roads (Continued)

DW3, FA-363-JFC EDG, 365-BA and 312D, Fairfax and Prince William Counties; soil surface treatment 7 mi. Route C-622 S.P. FAS 1319-E, FAS 6-A, Henry Co.

Wash., Anacortes — See "Contracts Awarded."

Wash., Kirkland—See "Contracts Awarded."

Wash., Tacoma—See "Contracts Awarded."

CONTRACTS AWARDED

Alabama—State Hy. Comn., c/o G. Scott, pres., Montgomery, grading, draining, sand-clay surfacing, constructing concrete, steel overhead 0.176 mi. road FAGM 274D, in Wadley, Randolph Co., to J. E. Milam, 295 Altoona Place, Atlanta, Ga., **$23,040*****grading, draining, sand-clay surfacing 1.16 mi. Roanoke-Wadley Rd., FAS 274E, Randolph Co., to Carlton Contg. Co., Albany, Ga., **$36,285*****bridge on same road, to Southern Constr. Co., 615 South 11th St., Birmingham, **$76,675*****surface treating 1.213 mi. 9th and 15th Sts., in Tuscaloosa, FAP 150-A, reop. and Ext., Tuscaloosa Co., to H. N. Donahoo, 517 North 22nd St., Birmingham, **$41,673.** Grand total $177,673. Bids Nov. 2. Noted Oct. 25, C.D.—Oct. 28, E.N.-R.

★**Alabama**—St. Hy. Dpt., Montgomery, grading, draining, single bituminous surface treatment with cold premix seal and concrete and steel bridges on 6.698 mi. York-Butler Rd., FAP 258 B & C, Sumter Co., to Philips Constr. Co., Birmingham, **$66,190*****grading, draining, double bituminous surface treatment 6.328 mi. Bucksville-Woodstock Rd., Tuscaloosa Co., to J. W. Gwin, Comer Bldg., Birmingham, **$105,188*****9.62 mi. Troy-Brundidge Rd., FAP 227, Pike Co., to Espy Paving Co., 2821 Bull St., Savannah, Ga.,, **$107,821*****grading, draining, single bituminous surface treatment with cold premix seal 8.12 mi. York-Butler Rd. FAP 258D Sumter Co., to H. E. Wolfe Constr. Co., St. Augustine, Fla., **$156,611*****bridges on same road, to M. Wunderlich, Martin Bldg., Birmingham, **$28,685*****grading, draining, double bituminous surface treatment concrete and steel bridge on 13.912 mi. Geneva-Dothan Rd., FAP 89A, FAP 260B, Geneva Co., to Vandigriff Constr. Co., Bell Bldg., Montgomery, **$195,430*****constructing concrete, steel bridges 7.872 mi. Calvert-Jackson Rd. FAP 98 and 81, Washington and Mobile Counties, to Peterson & Earnhart, Montgomery, **$122,621.** Grand total $625,934. Bids Nov. 30. Noted Nov. 15, C.D.—Nov. 18, E.N.-R.

Ariz., Phoenix—City Comn., curbing, paving, etc., portions Wilshire Dr., Lewis, West Vernon and Third Aves. to Arizona Sand & Rock Co., South 7th and River Banks Sts., **$23,755. P.W.A.** Bids Nov. 23. J. Girand, Phoenix, engr.

Ariz., Phoenix—City Comn., paving, curbing, guttering, etc. portions 11th and 13th Aves., to Phoenix-Tempe Stone Co., 1300 West Buchanan St., **$34,992.** Est. $54,654. **P.W.A.** Bids Dec. 7. J. Girand, Phoenix, engr.

California—State Hy. Comn., C. H. Purcell, state hy. engr., State Bldg., Los Angeles, drainage structures, excavating ditches and grading 2.4 mi. road approaches and applying penetration oil treatment between Bitter Point and north arm of Newport Bay, Orange Co., to Mimmitt & Taylor, 815 East 59th St., Los Angeles, **$26,480;** grading, drainage structures, asphaltic concrete paving hy. at intersection Firestone Blvd. and Sante Fe Ave., Los Angeles Co., to Griffith Co., Railway Bldg., Los Angeles, **$17,677.** Bids Dec. 2. Noted Nov. 16, C.D.—Nov. 18, E.N.-R.

★**California**—C. H. Purcell, P. Wks. Bldg., Sacramento, grading, road mix surfacing 2 mi. hy. between 1.5 mi. west of Bishop & Bishop, Inyo Co., to Basich Bros., 20,530 South Normandie Ave., Torrance, **$15,434*****grading, applying penetration oil treatment on 4.75 mi. hy. east of Panamint Sink and Death Valley National Monument, Inyo Co., to Silva & Hill Constr. Co., 600 East Elk Ave., Glendale, **$31,855*****grading, road mix on crusher run surfacing 6.3 mi. hy. between Inspiration Point and Los Gatos, Santa Cruz and Santa Clara Counties to Heafey-Moore Co. and Fredrickson & Watson Constr. Co., 344 High St., Oakland, **$895,045.** Grand total $942,334. Bids Dec. 8. Noted Nov. 24, C.D.—

California—L. H. Gibson, dist. engr. State Hy. Comn., 50 Higuera St., San Luis Obispo, grading, plant mixed on crusher run surfacing, extending rein.-con. culverts on 0.2 mi. hy. at Harmony Creek and Pennington Creek, San Luis Obispo Co., to L. A. Briscoe, P. O. Box 656, Arroyo Grande, **$8,483.** Bids Dec. 14. Noted Dec. 3, C.D.

Calif., Long Beach—R. M. Dorton, city mgr., improving Alamitos Ave. from Ocean St. to 7th St., to Sully Miller Contg. Co., 1500 West 7th St., **$45,413.** Bids Dec. 2, awarded Dec. 14. Noted Nov. 29, C.D.

Calif., Los Angeles—Bd. P. Wks., grading, paving streets in and adjacent to Union Passenger Terminal, Alamada St. and Aliso St. Improvement Dist., to Southern California Roads Co., 2145 East 25th St., **$34,408. P.W.A.** Bids Nov. 3.

Calif., San Francisco—Golden Gate International Exposition, 585 Bush St., constructing roadway from east portal of San Francisco-Oakland Bay Bridge tunnel around south side of Yerba Buena Island, Yerba Buena Shoals, San Francisco Bay, involving 17,500 cu. yd. excav., 1,750 cu. yd. structural excav., to Parish Bros., 1222 North Gower St., Los Angeles, **$67,965.** Bids Dec. 6. Noted Nov. 26, C.D.

Calif., San Jose—City Council, improving portion of Lincoln Ave., involving 1,018 tons asphaltic concrete wearing surface, type A, 23 tons same, type C, 7,600 sq. yd. asphalt paint binder, 3,500 sq. ft. asphaltic surface to be removed, to Union Paving Co., 212 Babcock Bldg., San Francisco, **$5,534.** Noted Dec. 17, C.D.—Dec. 23, E.N.-R.

Colorado—State Hy. Dpt., Denver, gravel surfacing 6.612 mi. State Hy. 9, between Hartsel and Fairplay, Park Co., to Hinman Bros. Constr. Co., P. O. Box 2882, Denver, **$62,886.** Bids Dec. 15. Noted Dec. 10, C.D.

Colorado—State Hy. Dpt., Denver, gravel surfacing 1.499 mi. State Hy. 2, at Hot Sulphur Springs, Grand Co., to H. Kranz, Como, **$37,091.** Bids Dec. 14. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

Connecticut—R. E. Hurley, comr. P. Wks., State Office Bldg., Hartford, waterbound macadam rock paving 7,420 ft. Rock House Hill, Oxford to White Oak Excavators Inc., Plainville, **$56,200;** rein.-con. paving 6,980 ft. East Center St., Manchester, to A. I. Savin Constr. Co., 10 Village St., East Hartford, **$55,787** and **$142,154** respectively. Est. $197,942. Bids Nov. 30. Noted Nov. 22, C.D.—Nov. 25, E.N.-R.

Georgia—State Hy. Bd., Atlanta, improving 2.421 mi. Hiawassee-Clayton Rd., Towns Co., to S. E. Finley, 292 North Ave., Atlanta, **$22,539*****10.995 mi. Warrenton to Sparta Rd., Warren and Hancock Counties, to J. Monagham, Inc., Pelham, **$82,097*****0.765 mi. Savannah Municipal Airport Rd., Post Road Project, Chatham Co., to M. J. Carroll Constr. Co., Orlando, Fla., **$16,110*****5.207 mi. Cuthbert-Blakely Rd., Randolph Co., to Claussen-Lawrence Constr. Co., 1394 Gwinnett St., Augusta, **$69,157** *** grading, surfacing 1.689 mi. Post Rd. Div. Project on Manchester-Cholybeate Springs Rd., Meriwether Co., and 2.576 mi. Houston Lake-Ocheconee Rd., Houston Co., to Beckham Lawler Constr. Co., Perry, **$12,107** and **$13,181** respectively ***1.826 mi. Whitesville to Jones Crossroads, Harris Co., to M. C. Cadell, Jacksonville, Fla., **$5,455*****0.657 mi. Alma to Baxley Rd., Bacon Co., and 2.193 mi. S.R. 32, Coffee Co., to J. E. Ballenger Constr. Co., Lakeland, Fla., **$4,218** and **$16,324** respectively*** 4.092 mi. Barwith-Paro Rd., Thomas and Brooks Counties, to Manley Constr. Co., Ocala, Fla., **$23,006** *** underpass and approaches at Clisby St. at Central of Georgia R.R. in city of Macon, Bibb Co., to Coffee Constr. Co., Eastman, **$53,333.** Grand total $317,527. Bids Dec. 17. Noted Dec. 7 C.D. —Dec. 9, E.N.-R.

Ill., Cicero—Cook Co., Chicago, concrete paving 31st St. from Austin Blvd. to 52nd Ave., to P. J. Crowley Co., Broadview, **$105,712.** Bids Dec. 3.

Ill., Peoria—City, to McElwee & Rogy, foot of Cass St., concrete paving Bootz Ave., Sect. 1, **$14,903;** Phelps St., Sect. 2, **$9,442;** Alexander Ave., Sect. 3, **$12,527;** Hangs Ave., Sect. 4, **$12,359;** Spitznagel St., Sect. 5, **$11,526;** Rock Island Ave., Sect. 6, **$30,202;** Westmoreland St., Sect. 7, **$22,281;** Argo St., Sect. 8, **$20,437;** Lincoln Park Pl. and S. L. Park Pl., Sect. 9, **$5,896;** Pope St., Sect. 10, **$9,103;** George St., Sect. 11, **$8,213;** Helen and Cass Sts., Sect. 12, **$11,624;** Lisk St., Sect. 13, **$3,260;** Tyng St., Sect. 14, **$4,362;** Nowland St., Sect. 15, **$2,625.** Grand total $177,950. **P.W.A.**

Ill., Pulaski—City, paving streets, to F. F. Weir Constr. Co., Moline, **$179,896. P.W.A.** Bids Dec. 6. Noted Dec. 2, C.D.

Ia., Buffalo Center—City, grading, curbing, asphalt surfacing streets, to Gillotti Constr. Co., Des Moines, **$26,657.** Est. $29,000. Bids Dec. 17. Henningson Eng. Co., Omaha, Neb., engrs.

Ia., Marcus—City, grading, curbing, guttering, asphaltic surfacing roads, to Donhow & Anderson, Des Moines, **$166,938.** Bids Dec. 17. Noted Dec. 1, C.D.—Dec. 9, E.N.-R.

Kansas—State Hy. Comn., at office County Clerk, St. John, light type surfacing 6 mi. P 93 FAS 44A, Stafford Co., to J. H. Shears Sons, Hutchinson, **$3,897.** Bids Nov. 30. Noted Nov. 16, C.D.—Nov. 18, E.N.-R.

Kansas—State Hy. Comn., at office County Clerk, Columbus, earthwork and culverts, 1.552 mi. WPSO 561 **$6,128*****light type surfacing 1.556 mi. WPSO 561, to M. W. Watson, Topeka, **$611*****earthwork 0.463 mi. P. 166-11-FA 299AB to R. G. Aldridge, 1310 State St., Kansas City, Kan., **$22,684*****light type surfacing 0.463 mi. P. 166-11-FA 299AB, to H. J. Hall Constr. Co., Manhattan, **$314***** constructing Bridge, Station 80-05.5, two 10x10x40 ft. rein.-con., WPSO 561, to V. N. L. Sherwood, Independence, **$1,118*****constructing Bridge 3.0, 55-65-55 ft. I-beam span, P. 166-11-FA 299AB, to F. H. Fraeto, Pittsburg, **$22,747** all foregoing Cherokee Co.***resurfacing material 26.05 mi. P. 68-6-1-4616, Miami Co., to Cook & Cone, Ottawa, **$8,753.** Grand total $62,355. Bids Dec. 2. Noted Nov. 16 and 22, C.D.—Nov. 18 and Dec. 2, E.N.-R.

Kansas—State Hy. Comn., at office County Clerk, Atchison, to Cook & Ransome, Ottawa, earthwork and paving 0.198 mi. P. 59-3-

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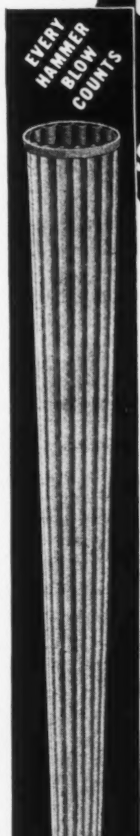

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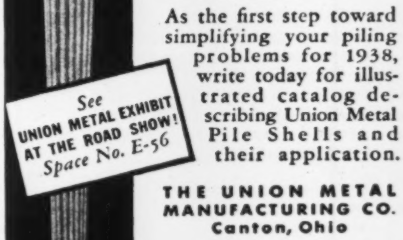

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Streets and Roads (Continued)

NRM 83F, 59-3-FA 83F, Atchison Co. **$26,381** *** to Yant Constr. Co., 1115 Omaha Natl. Bank Bldg., Omaha, Neb., resurfacing material 9.21 mi. P. 11-58-1607, **$1,122;** 11.96 mi. P. 77-58-1608, **$1,457;** 10.39 mi. P. 77-58-1609, **$1,266,** all foregoing Marshall Co.; 22.32 mi. P. 11-75-1610, **$2,768;** 0.5 mi. P. 11-75-1611, **$62,** both Pottawatamie Co.***to O. H. Schmidt, St. Joseph, Mo., 12.06 mi. P. 73-7-1606, Brown Co. **$4,197.** Grand total $43,392. Bids Dec. 7. Noted Nov. 22, C.D.—Dec. 2, E.N.-R.

Kansas—State Hy. Comn., at office County Clerk, Mankato, to Inland Constr. Co., Topeka, light type surfacing 0.568 mi. P. 13-9-FA 256A, Chase Co. **$687*****to V. M. L. Sherwood, Independence, earthwork and light type surfacing 0.473 mi. P. 14-45-FA 425B, Jewell Co. **$4,563*****to J. Coffey, Topeka, earthwork and culverts 0.596 mi. P. 10-64-K 2025, Morris Co. **$1,780*****to M. W. Watson, Topeka, resurfacing material 13.7 mi. P. 4-85-2566, Saline Co. **$3,178;** 18.5 mi. P. 15-21-2569, Dickinson Co. **$4,181;** 16.4 mi. P. 4-21-2571, Dickinson Co. **$4,395*****to H. G. Hansen, Logan, 3 mi. P. 41-72-2566, Ottawa Co. **$1,737*****to Cook & Cone, Ottawa, 27.4 mi. P. 15-14-2567, Clay Co. **$6,652;** 4 mi. P. 80-14-2570 Clay Co. **$792*****to B. Anderson & Sons, Soldier, Kan., constructing Bridge 5.8, three 14x14x56 ft. rein.-con., P. 14-45-FA-425B Jewell Co., **$7,560.** Grand total $43,086. Bids Dec. 8. Noted Nov. 22, C.D.—Dec. 2, E.N.-R.

Kansas—State Hy. Comn. at office County Clerk, Lyons, light type surfacing 7.978 mi. Project 80-FAS 17, and 9.978 mi. Project 80-FAS 18A, Rice Co., to Yant Constr. Co., 1115 Omaha Natl. Bank Bldg., Omaha, Nebr., **$7,019** and **$6,823** respectively. Bids Dec. 16. Noted Nov. 22, C.D.—Dec. 2, E.N.-R.

Md., Baltimore—Bd. Awards, Municipal Bldg., sheet asphalt paving, 15,000 sq. yd. streets, Paving Contr. 694, to National Paving & Contg. Co., Menlo Dr. and Wheeling & Maryland R. R., **$74,322.** Bids Dec. 8. Noted Nov. 30, C.D.—Dec. 2, E.N.-R.

Michigan—State Hy. Dpt., Lansing, grading, drainage structures, concrete paving 4½ mi. hy. on U. S. 25, south of Port Sanilac, Sanilac Co., to J. H. Baker & Sons, Port Huron, **$235,812.** Bids Dec. 15. Noted Dec. 10, C.D.

★**Mississippi**—E. D. Kenna, dir. Hy. Comn., Jackson, improving 2.826 mi. Vicksburg-Redwood Hy., Warren Co., to Carey-Reed Co., 543 South Farish St., Jackson, **$85,080***** 7.365 mi. Meridian-Quitman Hy., Lauderdale Co., to Couch Constr. Co., Dothan, Ala., **$163,073*****2.203 mi. Meridian-Quitman Hy., Lauderdale Co., to T. M. Strider & Co., West Meade Farm, Nashville, Tenn., **$150,407***** 4.135 mi. Beaumont-Laurel Hy., Jones and Perry Counties, to Cornell Young Co., Macon, Ga., **$85,778*****10.543 mi. Columbus-Aberdeen Hy., Monroe Co., to Trinidad Asphalt Mfg. Co., 600 St. Teresa St., St. Louis, Mo., **$164,290*****1.725 mi. Coles-Crosby Hy., Amite and Wilkinson Counties, and 7.613 mi. New Albany-Blue Mountain Hy., Tippah and Union Counties, to J. E. Meador & Co., Arkadelphia, Ark., **$33,280** and **$78,427** respectively***2.141 mi. Blue Mountain-Ripley-Falkner Hy., Tippah Co., to Skrainka Constr. Co., 7173 Delmar St., St. Louis, Mo., **$32,291*****0.534 mi. Mt. Olive-McGee Hy., Simpson Co., to E. Morgan Co., Century Bldg., Jackson, **$3,603.** Grand total $796,229. Bids Dec. 7. Noted Dec. 1, C.D.

★**Mo., St. Louis**—City, about 648,000 sq. ft. concrete sidewalks in various parts of city. **W.P.A.** forces. **$1,935,000.** $764,053 W.P.A. grant allotted.

†**Montana**—Pub. Roads, Post Office Bldg., Portland, bituminous aggregates on 42.3 mi. road Red Lodge-Cooke City approach to Yellowstone Natl. Park, Park Co., to C. Shannon, Butte, **$61,040.** Bids Oct. 27. Noted Oct. 6, C.D.—Oct. 14, E.N.-R.

N. J., Middlesex—Plainsboro Twp. Committee, bituminous concrete on macadam surfacing 13,928 sq. yd. Dey Rd., to G. C. Cochran, Frazer St., Trenton, **$22,864.** Bids Dec. 8.

N. J., Orange—City, replacing blue stone curb with granite curb, paving trolley tracks with asphalt surface on 1,430 ft. Main St., 60 ft. to 100 ft. wide, **W.P.A.** labor. **$25,000.** Town will purchase sand and curb, WPA will purchase some material. K. Crane, Town Hall, engr.

New York—A. W. Brandt, comr. Dpt. P. Wks., Albany, improving 5.83 mi. roads in Ontario Co., to Canty, O'Neil & Candell, Inc., Root Bldg., Buffalo, **$54,783** est. $101,495*** 0.19 mi. Erie Co., to Brayer Bros. Constr. Co., Inc., 1615 William St., Buffalo, **$21,957** est. $26,919***5.24 mi. Sullivan Co., to Lane Constr. Corp., 37 Colony St., Meriden, Conn., **$336,893** est. $408,762***metals railings in Westchester Co., to E. J. Doyle Bridge Co., Scarsdale, **$2,560** est. $3,450***roadside improvement in Bronx Co., to Yonkers Nursery, Inc., Tuckahoe Rd., Yonkers, **$32,003** est. $37,488. Grand total $448,195. Bids Nov. 30. Noted Nov. 12, C.D.—Nov. 18, E.N.-R.

N. Y., Ballston Spa—Bd. Supervs. Saratoga Co., improving guttering, maintenance, bituminous materials and gravel surfacing various highways, own forces. **$100,000.**

N. Y., Delhi—Delaware Co., grading, guttering, bituminous paving, graveling and maintenance various county highways, own forces. **$130,000.** Funds appropriated. Owner will supervise and purchase materials.

N. Y., Herkimer—Bd. Supervs. Herkimer Co., grading, guttering, bituminous surfacing, graveling various county highways, own forces. **$160,000.** Funds appropriated. Owner will purchase materials.

N. Y., Ogden—Bd. Supervs. Monroe Co., gravel and bituminous materials paving Covell and Euller Rds., etc., **W.P.A.** labor. **$49,595.** Owner will supervise and purchase materials.

N. Y., Otsego—Bd. Supervs. Otsego Co., Cooperstown, guttering, maintenance, bituminous paving various county highways, own forces. **$25,000.** Funds appropriated. Owner will supervise and purchase materials.

N. Y., Utica—Bd. Supervs. Oneida Co., guttering, bituminous paving, graveling and maintenance of highways, by own forces. **$150,000.** Owner will supervise and purchase materials.

O., Akron—City, extending South High St. from new viaduct to South Main St., by necessary grading, drainage and asphalt paving, to McCourt Constr. Co., Emerling Ave., **$93,022.** Est. $90,000.

South Carolina—B. M. Sawyer, state hy. comr., Columbus, bituminous surfacing 9.931 mi. S.R. 763 from Elliott to Oswego, S.R. 822-A & B, Lee and Sumter Counties, to J. B. Britton, Sumter. **$107,543.** Bids Nov. 9. Noted Oct. 29, C.D.—Nov. 4, E.N.-R.

Texas—J. Montgomery, state hy. engr., Austin, grading 0.411 mi. State Hys. 6 and 146, Galveston Co., to Ohlhausen Dredging Co., 307-21st St., Galveston, **$18,238.** Est. $20,000. Bids Oct. 26. Noted Oct. 19, C.D.—Oct. 21, E.N.-R.

Texas—J. Montgomery, state hy. engr., Austin, grading, drainage structures, flexible base, asphalt surface treating 13.869 mi. State Hy. 7, Coryell Co., to Cage Bros., Bishop, **$83,661.** Est. $85,000. Noted Nov. 15, C.D.

Tex., Odessa—Comrs. Ector Co., c/o A. W. Moore, grading, drainage Odessa, structures, caliche base surfacing 12.7 mi. hy. Odessa to Kermit, to E. F. Bucy and C. T. Childs, Rising Star, **$47,612.** Bids Nov. 12. Noted Nov. 9, C.D.

Tex., Seguin—M. Starcke, mayor, improving business and residential streets, incl. 24,000 sq. yd. two course inverted penetration asphalt pavement, **W.P.A.** labor. **$45,000.** W.P.A. will purchase materials. Engineer, c/o City Eng. Branch and W.P.A. Engineers, engr.

Wash., Anacortes—City, clearing, grading, draining, surfacing 11th and other streets, **W.P.A.** crews. **$40,000.**

Wash., Kirkland—City, clearing, grubbing, excavating, grading, sloping, ditching, draining, surfacing, constructing curbs and gutters, installing culverts and graveling, **W.P.A.** forces. **$53,165.** $47,541 allotted by W.P.A. City providing $5,624 for materials.

Wash., Tacoma—City, clearing, grading, draining, rounding of corners, installing culvert pipes and guard rails, **W.P.A.** labor. **$60,338.** C. D. Forsbeck, city engr.

†**Wyoming and Montana**—Pub. Roads, Post Office Bldg., Portland, Ore., bituminous aggregate surfacing 42.3 mi. Red Lodge-Cooke City approach, Yellowstone Natl. Park, to C. Shannon, Butte, Mont., **$61,040.** Bids Oct. 27. Noted Oct. 5, C.D.—Oct. 7, E.N.-R.

Que., Senneterre—Dpt. Roads, Quebec City, constructing 28 mi. road to join Lacoma Mine to Senneterre, to E. Bilodeau, Senneterre. Est. **$50,000.**

EARTHWORK, WATERWAYS

PROPOSED WORK

Calif., San Jose — City Council bids in about 15 days, constructing flood canal between Kammerer Ave., near Story Rd. and Coyote Creek. $20,000-$25,000. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

★**Neb., Shelton**—North Side Ditch Irrigation Project plans irrigation project in Buffalo and Platte Counties. $2,000,000. Organization now being organized and will apply for charter soon. Hope for funds from P.W.A. as part of Sutherland Project. A. B. Holmberg Shelton, chn., M. H. Leo, Shelton, secy.

N. Y., Binghamton—City, City Hall, plans constructing 1,000 ft. flood wall on Noyes Island on banks of Susquehanna River. $50,000. Owners now obtaining rights-of-way from Manufacturing Concerns owning shore property. J. A. Giles, City Hall, engr.

N. Y., Cuba—State Conservation Dpt., Bureau State Parks, State Bldg., Albany, soon takes bids constructing concrete spillway at Cuba Lake. $15,000-$20,000 or more. Noted June 10, C.D.—June 17, E.N.-R.

N. Y., Schenectady—City, City Hall, making plans back water gates and pump well for pumping station at Barge Canal Terminal as flood control measure. To exceed $15,000. **Maturity 1938.** L. C. Purdy, city engr.

†**N. Y., Shushan**—U. S. Eng., Wash., D. C., plans constructing flood control storage dam on Battenkill River, near here, Washington Co. To exceed $15,000.

hwork, etc. (Continued)

N. Y., **Whitehall**—U. S. Eng., Wash., C., plans constructing flood control dam ween Whitehall and North Granville, to ound flood water of Mettowee River. exceed **$15,000.**

N. Y., **Whitney Point**—U. S. Eng., ual Security Bldg., Binghamton, indefi- ly postponed construction dam for flood trol until studies are completed to deter- whether power potentialities exist in posed location. Noted Oct. 27, C.D.—Nov. E.N.-R.

Okla., Vinita—Grand River Dam Authority, Vinita, filed with Federal Power Commis- its declaration of intention to construct about 147 ft. high above rock bed and create 2,000,000 acre ft. capacity reser- in Grand River and hydro-electric plant, 80,000 hp. generating plant, in Mayes, aware, and Ottawa Counties for flood con- irrigation, and power development. Fed- government has made grant of $8,437,000 authority and agreed to loan $11,563,000 ugh purchase of its revenue bonds. Total 000,000. W. R. Holway, Tulsa, consult. Noted Nov. 1, C.D.—Nov. 4, E.N.-R.

Ore., Klamath Falls—See "Sewerage and aste Disposal."

. B., **Saint John**—National Harbors Bd., awa, Ont., soon takes bids constructing khead at Market Slip in harbour. $15,- A. E. Dubuc, Ottawa, Ont., engr.

Ont., Waldemar—Grand River Conserva- tion Comn., W. Phillips, Galt, chn., ns dam here, as 1st unit of water con- ation project in Waterloo, Brant and llington Counties to cost $1,395,000. J. cIntosh, 620 University Ave., Toronto, gr.

DS ASKED

Idaho, Mesa—Jan. 11, by Mesa Irrigation st., rebuilding 5.1 mi. woden flumes, in- ving clearing and piling brush, removal reshaping present flume and flume bed rebuilding flume and structures. $58,500. H. Ninneman, 911 North 7th St., Boise, gr. Noted Oct. 27, C.D.—Nov. 4, E.N.-R.

Kan., Topeka—Jan. 13, by P. A. Hodgson, Manufacturers Bldg., Kansas City, Mo., 000 yd. excavation on right banks Kansas ver. Private plans.

†Louisiana—Jan. 17, by U. S. Eng., 2nd st., New Orleans, excavating about 3,- 000 cu. yd. earth in enlarging existing dslide borrow pits of Hamburg-Palmetto Palmetto-Courtableau levees for drainage.

†Massachusetts—Jan. 20, by U. S. Engr., rk Square Bldg., Boston, Mass., dredging out 617,200 cu. yd. place measurement be- een Stations 70 plus 00 and 110 plus 00 in pe Cod Canal., adv. E.N.-R. Dec. 30.

†Mich., Menominee—Jan. 14, by U. S. Eng., waukee, Wis., dredging about 115,000 cu. in Menominee Harbor.

N. Y., **Johnson City**—See "Contracts warded."

OW BIDDERS

★**†Pa., Ford City**—U. S. Eng., Federal Bldg., Pittsburgh, Pa., Dec. 17, construct- g Crooked Creek Dam, near here, from M. Brewster & Sons, 253 West Fort Lee , Bogota, N. J., **$2,367,511.** Est. $3,219,238. oted Dec. 9, C.D.

★**†Pa., Tionesta**—U. S. Eng., Federal Bldg., Pittsburgh, Pa., Dec. 18, constructing onesta Dam in Allegheny River, from S. J. roves & Sons Co., 509 Wesley Temple Bldg., nneapolis, Minn., **$2,624,610.** Noted Nov. C.D.—Dec. 2, E.N.-R.

ONTRACTS AWARDED

Calif., La Mesa—La Mesa, Lemon Grove and ring Valley Irrigation Dist., constructing st unit) of water distribution system, incl. 000 cu. yd. excav. and backfill, 5,000 sq. ft. vement, cut and replaced, 3,200 ft. 12 in., 00 ft. 8 in., 43,000 ft. 6 in., and 11,000 ft. in. c.i. pipe, 52,000 lb. c.i. fittings, to M. atick, 1269 Colorado Blvd., Los Angeles, **4,999**, omitting service connections. Subject **P.W.A.** approval. Bids Dec. 14. Noted Nov. C.D.—Dec. 2, E.N.-R.

†Conn., Stamford—U. S. Eng., Providence, I., dredging 90,000 cu. yd. East Branch mford Harbor, to Long Island Dredging rp., 149-27 Jamaica Ave., Jamaica, N. Y., **8,720.** Bids Nov. 26. Noted Nov. 15, C.D. Nov. 18, E.N.-R.

Ill., Mounds City—State Div. Waterways, pt. P. Wks. & Buildings, Springfield, repair- g rear and flank levees, here, to Central est Co., 9 South Clinton St., Chicago, **$19,- 03.**

†Ia., Bellevue—U. S. Eng., Clock Tower dg., Rock Island, Ill., clearing 1,275 acres Pool 12, Mississippi River, upstream from re, to E. J. Fischer, 4134 Westminster ., St. Louis, Mo., **$86,999.** Bids Dec. 10. oted Nov. 30, C.D.—Dec. 2, E.N.-R.

†Ia., Burlington—U. S. Eng., Clock Tower dg., Rock Island, Ill., clearing 1,140 acres Parcel 3, Pool area above Lock and Dam 18, Mississippi River, near here, by Government plant and hired labor. Bids Nov. 17, rejected. Noted Nov. 10, C.D.

†Ia., Clinton — U. S. Eng., Clock Tower Bldg., Rock Island, Ill., clearing Parcel 1, Pool 13, Mississippi River, upstream from here, to R. Newton McDowell, Midland Bldg., Kansas City, Mo., **$71,880.** Bids Dec. 9. Noted Nov. 30, C.D.—Dec. 2, E.N.-R.

†Missouri—U. S. Eng., 816 U. S. Court House and Custom House, rebuilding and enlarging 5.6 mi. levees on Mississippi River, in Levee Dists. 2 and 3, Perry Co., to Driver Co., Memphis, Tenn., **$211,307.** Bids Nov. 19. Noted Nov. 5, C.D.—Nov. 11, E.N.-R.

★**New York**—Dpt. P. Wks., State Bldg., Albany, excavating 530,000 cu. yd. Barge Canal between Lock 8 at Scotia to Lock 101 at Cranesville, Schenectady and Montgomery Counties, to W. E. Callahan Constr. Co., 2034 Moxley St., Dallas, Tex., **$842,700.** Est. $946,600. Bids Nov. 30. Noted Dec. 6, C.D. —Dec. 9, E.N.-R.

N. Y., Johnson City—Village, Village Hall, clearing, deepening and strengthening of various creeks and streams, **W.P.A.** labor. **$20,000. Maturity in April.** W.P.A. Engineers and owner will supervise.

★**Texas**—Brazos River Conservation & Reclamation Dist. of Lower Colorado River Authority, c/o J. A. Norris, genl. mgr., c/o Kyle Hotel, Temple, bids about Jan. 10, constructing Possum Kingdom Dam on Brazos River, in Pinto Co. Flood control, irrigation and power project, involving concrete and rockfill embankment construction, 2,250 ft. in overall length with crest of non-overflow section approximately 145 ft. above present stream bed. $4,500,000. Amberson Eng. Co., 295 Madison Ave., New York, engrs. Noted Oct. 4, C.D.—Oct. 7, E.N.-R.

UNCLASSIFIED

PROPOSED WORK

★**Calif., Los Angeles** — TRANSMISSION LINE COMPLETION, etc.—Southern California Edison Co., Edison Bldg., plans following construction work during 1938, incl. completion of Boulder transmission line to Chino sub-station, $600,000; extensions at Chino substation, $1,130,000; miscellaneous transmission lines $1,000,000; substation at Santa Monica, $103,000; substation at Huntington Park, $185,000; substation additions in Santa Barbara and Pasadena, $325,000. Total $3,343,000.

★**Calif., Oakland** — AIRPORT IMPROVEMENTS—City, Port Comn., Grove St. Pier, plans miscellaneous field improvements at Oakland municipal airport, $500,000; roadway improvements 9th Ave. Pier, $20,000; repairs to Livingston and Dennison St. Wharves, $30,000; rehabilitation of warehouse, $10,000; miscellaneous improvements of structures, $25,000. Total est. $585,000. A. H. Abel, Grove St. Pier, engr.

Ia., Centerville—SWIMMING POOL—City voted $10,000 for constructing swimming pool. $52,000. P.W.A. project.

La., Baton Rouge—PIPE LINES—See "Industrial Buildings."

★**Mo., St. Louis**—RAILROAD IMPROVEMENTS—St. Louis-San Francisco Railway, F. G. Jonah, ch. engr., Frisco Bldg., has had construction budget approved by U. S. District Judge G. H. Moore, for 13,200 tons 112-lb. rail and 4,800 tons track fastenings, $1,172,827; bridges, trestles and culverts $1,017,303; signal and interlockers $134,537; locomotives and cars $850,743, miscellaneous items $288,962. Total $3,464,336.

Nebraska—TRANSMISSION LINE—Central Nebraska Public Power & Irrigation Dist., G. E. Johnson, ch. engr. and genl. mgr., Hastings, made plans and soon takes bids 56 mi. power transmission line from Sutherlands power house near North Platte to Keystone Dam, near Keystone. Authority for construction given by State Railway Comn. Est. about $200,000. E. E. Chilberg, Hastings, electric engr.

★**N. J., Somerville**—FAIR GROUNDS—Central New Jersey Agricultural Assn., c/o R. M. Williams, Hotel Somerset, plans constructing fair grounds development, incl. fair grounds, race track, water course, aviation field, stock yards, stable, auditorium, park hotel, club houses, waterways, roads, contest fields, arenas and golf course. $1,500,000. Architect not appointed.

N. M., Artesia—RURAL ELECTRIC LINES —Central Valley Electrical Corp., soon takes bids 86 mi. rural electric lines and power plant building, also two 450 to 600 kw. and one 300 kw. generators, 12,000 hp. capacity. Burns & McDonnell Eng. Co., 107 West Linwood Blvd., Kansas City, Mo., engrs.

N. Y., Brooklyn — TRAVELING CRANE, etc.—Pennsylvania R.R. Co., A. C. Watson, ch. engr. New York Zone, Pennsylvania Station, New York, plans traveling crane and loading facilities, 164 Kent Ave. Private plans.

N. Y., New York—PIER—Dpt. Docks, Pier A, Battery Pl., North River, plans constructing new pier, foot West 24th St. Panama

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†**N. Y., Niagara Falls**—PARK—National Park Div., Wash., D. C., plans creating Niagara Falls National Park on 621 acre tract, near here. To exceed $25,000.

†**N. Y., Rochester**—HANGAR—Bureau Air Commerce, Wash., D. C., plans remodeling hangar at city airport. $6,748. **Maturity at once.**

†**N. Y., Syracuse**—HANGAR—Bureau Air Comerce, Wash., D. C., plans remodeling and improving hangar at airport. $2,511. **Maturity at once.**

★**Ohio** — TELEPHONE IMPROVEMENTS—Ohio Bell Telephone Co., 750 Huron Rd., Cleveland, plans to spend $10,500,000 for expansion of telephone equipment (no building expansion involved) in Cleveland, Akron, Canton and Youngstown. G. A. Kozitsky, 750 Huron Rd., ch. engr.

S. D., Pierre—PARK IMPROVEMENTS—City election Jan. 11 to vote $20,000 bond issue for park improvements at Farm Island adjoining the city, incl. golf course, concrete swimming pool, ball diamond, and various amusement equipment. W.P.A. allotment tentatively approved, would be **W.P.A.** labor.

S. D., Rapid City—AIRPORT—City approved $30,000 bonds for constructing new municipal airport. Option obtained on purchase 632 acres of land 8 mi. from city. Written approval given by Bureau of Air Commerce contingent on proper grading of runways and fencing. Also approved by Wyoming Air Service. Noted Sept. 13, C.D.—Sept. 16, E.N.-R.

★**Texas and Iowa**—GASOLINE PIPE LINE — Anderson-Prichard Oil Co., Ramsey Tower, Oklahoma City, Okla., surveys in progress for 1,350 mi. 6, 8 and 10 in. gasoline pipe line from refinery at Colorado, Tex., to Des Moines, Ia. $12,000,000. Ford, Bacon & Davis, 39 Bway., New York, engrs.

Tex., LaGrange—RURAL POWER LINES—Fayette County Rural Electric Cooperative, c/o G. Dies, chn., LaGrange, bids after Jan. 1 (competitive), constructing 120 mi. rural electric transmission lines in Fayette, Lavaca, Bastrop and Colorado Counties. $100,000. REA funds allotted. Hawley, Freese & Nichols, Capps Bldg., Fort Worth, engrs. Noted Nov. 12, C.D.—Nov. 18, E.N.-R.

Tex., Lubbock — RURAL ELECTRIFICATION—South Plains Electric Cooperative Co., c/o W. M. Ross, Lubbock, bids after Jan. 1, 110 mi. rural power electrication lines throughout Lubbock Dist. $100,000. REA funds allotted. H. N. Roberts, Lubbock, engr. Hawley, Freese & Nichols, Capps Bldg., Forth Worth, and Lubbock, engrs. Noted Nov. 17, C.D.—Nov. 25, E.N.-R.

★**Tex., San Antonio** — GAS SYSTEM IMPROVEMENTS—San Antonio Pub. Serv. Co., c/o D. A. Powell, executive vice pres. and genl. mgr., South St. Mary's St., plans physical improvements to present gas system, incl. new steel and c.i. mains, regulators, meters, some booster plant equipment, $500,000; also plans improvements in electrical division of Public Utilities Company, work will be primarily lines, overhead and underground, poles, meters, replacement equipment, also few small construction units at various plants of the Company, $500,000. Board Authorized expenditures during 1938. Owner's Engineering Branch, engrs.

★**Tex., Corpus Christi**—DOCKS, etc.—Corpus Christi Deep Water Port Comn., Corpus Christi, plans constructing oil dock on Corpus Christi Ship Channel. This will be the 6th such dock for Corpus Christi, due to enlarged refining facilities, it has become necessary to enlarge dock accommodations. Present docks are filled to capacity due to increased production made recently by several large companies, $350,000. Application to War Dept. made. Also plans constructing 200 ft. wide, 610 ft. long, and 32 ft. wide slip to be used as an auxiliary to others on account of the great preponderance in shipping business developed within the last few months on channel from Avery Point Turning Basin. $150,000. Application for permit made to War Dept. at Washington is classed "emergency."

Ont., Petrolia—GAS WELL, etc.—MacIntosh Oil & Gas Co., W. MacIntosh, pres., shareholders approved proposal for purchase more property and drilling additional wells for oil and gas. $25,000. **Maturity early in 1938.**

Sask., Tisdale—POWER LINE—Saskatchawan Power Comn., L. S. Thornton, chn., plans extending power line 26 mi. to towns of Arborfield and Aylesham from Tisdale with distribution systems also in each town. $80,000.

BIDS ASKED

†**Calif., Sacramento**—GASOLINE FUELING SYSTEM—Jan. 28, by Con. Q.M., Air Depot, gasoline fueling system at Sacramento Air Depot, Invitation 6870-38-16.

Mass., Lynn — ATHLETIC FIELD — See "Contracts Awarded."

Mass., Saugus — STANDS — See "Contracts Awarded."

Minn., Minneapolis—HEATING TUNNELS—See "Contracts Awarded."

Mo., St. Louis—PARK IMPROVEMENTS etc.—See "Contracts Awarded."

N. J., Cranford—PARK—See "Contracts Awarded."

N. J., Highland Park—PARKS—See "Contracts Awarded."

N. J., New Brunswick—GROUND IMPROVEMENTS—See "Contracts Awarded."

N. J., Summit—ATHLETIC FIELD—See "Contracts Awarded."

New York—TUNNEL—Jan. 11, by Port of New York Authority, 111 8th Ave., New York, constructing New York approach to north tube of Lincoln Tunnel, Contr. MHT-54.

N. Y., Buffalo—STADIUM—See "Contracts Awarded."

N. Y., New York — PIER — See "Contracts Awarded."

N. Y., Rochester—AIRPLANE HANGAR—See "Contracts Awarded."

N. Y., Rochester—STONE QUARRY—See "Contracts Awarded."

N. Y., Syracuse—GREENHOUSE—Jan. 27 (extended date), by State College of Forestry, Syracuse University, Education Bldg., Albany, constructing greenhouse at College of Forestry, Syracuse University. $35,000. Noted Nov. 22, C.D.—Nov. 25, E.N.-R.

N. Y., Utica—STREET LIGHTING—See "Contracts Awarded."

O., Canton—PARK DEVELOPMENT—See "Contracts Awarded."

Okla., Okmulgee — BOAT HOUSE, etc. — See Contracts Awarded."

Pa., Reading—AIRPORT—See "Contracts Awarded."

Pa., Oil City—AIRPORT—See "Contracts Awarded."

Tenn, Knoxville — ELECTRIC DISTRIBUTION SYSTEM—City, c/o W. Wynatt, mgr., new bids about Jan. 7, on revised plans constructing poles and lines to complete electrical distribution system, $175,000. P.W.A. project. Burns & McDonnell, 107 West Linwood Blvd., Kansas City, Mo., engrs. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

Wash., Battle Creek—IMPROVING SCHOOL GROUNDS—See "Contracts Awarded."

Wash., Puyallup — PARK — See "Contracts Awarded."

Ont., Sault Ste Marie—COAL DOCK—See "Contracts Awarded."

CONTRACTS AWARDED

Ala., Attalla — COALING STATION — Alabama Great Southern Ry. (subsidiary Southern Railway System. B. Berman, ch. engr., Wash., D. C.), designing and constructing 300 ton rein.-con. locomotive coaling station with sand handling facilities, to Fairbanks, Morse & Co., 515 Whall St. S.W., Atlanta, Ga.

Calif., Oakland—PIER EXTENSION—City Port Comn., foot of Grove St., Oakland, additions to 9th Ave. pier, foot of Grove St., to Healy-Tibbitts Constr. Co., 1 Drum St., San Francisco, **$108,372. P.W.A.** Bids Dec. 6. Noted Dec. 2, C.D.—Nov. 18, E.N.-R.

Calif., San Francisco—ENTRANCE STRUCTURES—Directors San Francisco Bay Exposition, Inc., 585 Bush St., constructing certain entrance structures and appurtenant work, incl. construction of wall from South Tower west to Air Terminal Building, Treasure Island, Worlds Fair site, to E. T. Lesure, 87 Ross Circle, Oakland, **$39,425.** Bids Dec. 13. Noted Dec. 7, C.D.

Conn., New Haven—PLATFORM—New York, New Haven & Hartford R. R. Co., E. E. Oviatt, ch. engr., New Haven, constructing 30x160 ft. rein.-con. platform for bus accomodations, New England Transportation Co., necessary building alterations and constructing 3,800 sq. yd. bituminous macadam drives, superstructure to Truscon Steel Co., 42 Church St.; drives and platform, to Lathrop & Shea Co., 178 Goffe St. Est. **$25,000**. Noted Dec. 9, C.D.—Dec. 16, E.N.-R., under "Contracts Awarded."

†**Ill., Alton**—CLEARING SITE—U. S. Eng., St. Louis, Mo.; clearing office building, Riverside Park, to Park Commission, at sale fi **$25;** concrete laboratory, to S. C. Cash Co., 817 North 9th St., St. Louis, Mo., $50. Bids Nov. 30. Rejected bids Nov. 30, on Items 3, 4 and 5. Noted Nov. 22, C.D.—Nov. 25, E.N.-R.

Ia., Centerville—SWIMMING POOL—City, constructing swimming pool, **W.P.A.** labor. **$52,000.** $10,000 bonds voted. Noted Oct. 13, C.D.—Oct. 21, E.N.-R.

Ia., Hampton — RURAL TRANSMISSION LINES—Franklin Co. Rural Electric Co-Operative, Hampton, installing 112 mi. rural electric power and light line, to Sandberg & Johnson, Hampton, **$158,293.** Est. $160,000. Contract awarded subject to REA Wash., D. C., approval. Bids Dec. 14, awarded Dec. 14. Noted Aug. 9, C.D.—Aug. 12, E.N.-R.

Mass., Lynn—ATHLETIC FIELD—City, J. F. Manning, mayor, City Hall, athletic field off Western Ave., incl. concrete stands, tennis

Unclassified (Continued)

courts, hockey rink, etc. **W.P.A.** labor. Est. **$[illegible]0,000. Maturity in spring.**

Mass., Saugus—STANDS, etc.—Town, F. Murphy, W.P.A. Co-ordinator, Town Hall, timber concrete stands, filling, grading and drainage for stadium. **W.P.A.** labor. Est. **$25,000.**

Mich., Zeeland — POWER LINE — Delta-Alger Electric Co-Operative, installing 113 mi. power lines to serve 472 homes in Delta-Alger County area, to Clifton Eng. Co., Zeeland, **$92,543.** REA.

†Minn., Minneapolis—HEATING TUNNELS—Veterans Administration Facility, Wash., D. C., constructing new 2,000 ft. rein.-con. heating tunnels to connect 2 buildings with central power plant at U. S. Veterans Facility, **W.P.A.** labor. $110,000.

Mo., Palmyra—RURAL ELECTRIC LINE—Missouri Rural Electric Co-Operative Assn., Palmyra, constructing 105 mi. rural electric line, to Federal Eng. & Constr. Co., 1822 Main St., Kansas City, Mo., **$85,050.**

★ **Mo., St. Louis**—PARK IMPROVEMENTS, etc.—Bd. Pub. Serv., City Hall, grading, planting trees and shrubs, seeding lawns, repairs to prevent erosion, improving tennis courts, baseball diamonds, swimming pools in various city parks, by **W.P.A.** labor. **$578,609.** of which W.P.A. supplied $535,664 grant; also constructing 500 ft. culvert and 1,800 ft. extension to runway at Lambert-St. Louis Municipal Airport at Bridgeton, **W.P.A.** labor. **$280,455,** of which W.P.A. supplied $239,358 grant. Private plans.

Mont., Butte — STADIUM — F. B. Taylor, chn. School Bd., general contract constructing athletic field and stadium, 10,000 persons capacity for high school, to Cahill-Mooney Constr. Co., 342 South Main St., Butte **$75,360*****painting, to Ellis Paint Co., Butte **$1,728*****plumbing and heating, to Western Plumbing & Heating Co., 102 East Park Ave. **$7,840.** Grand total $84,928. Bids Oct. 26. Noted Oct. 19, C.D.

Neb., Hastings — ELECTRIC CONDUITS—See "Public Buildings."

N. J., Cranford—PARK—Union Co. Park Comn., Elizabeth, constructing general improvements, to Unaning Park, consisting roads, drainage, sewers, lake, etc., relief labor. **$73,000. W.P.A.** Materials will be purchased by owner. J. H. Weitzen, 290 George St., New Brunswick, W.P.A. engr.

★ **N. J., Highland Park**—PARKS—Middlesex Co. Dpt. Hys. & Bridges, Paterson St., New Brunswick, constructing Ayers Beech Park on banks of Raritan River, consisting drainage, sewers, fill roads, etc., **$314,411.** W.P.A. share $306,911, County $7,500; constructing new park called Johnson Park, Sect. 1 on banks Raritan River, consisting drainage, sewer lines, fill roads, etc., **$338,043,** W.P.A. allotment $327,042, County $10,000. **W.P.A.** labor. Materials will be purchased by **W.P.A.**

N. J., New Brunswick—GROUND IMPROVEMENTS—Rutgers University-Women's College, improving grounds at New Jersey College for Women, by regrading area, sewers, driveways, etc., relief labor. **$27,000.** Materials will be purchased by **W.P.A.** and owner. J. H. Weitzen, 290 George St., W.P.A. engr.

N. J., Summit—ATHLETIC FIELD—City, City Hall, constructing athletic field at Morris Ave., relief labor. **$34,000. W.P.A.** Materials will be purchased by owner. J. H. Weitzer, 290 George St., New Brunswick, W.P.A. engr.

N Y., Buffalo—STADIUM—City, City Hall, constructing additional work on Roesch Memorial Stadium, own forces. **$207,000. W.P.A.** funds allotted. W.P.A. Engineers and owner will supervise. Noted Dec. 3, C.D.—Dec. 9, E.N.-R.

N. Y., New York—PIER—Dpt. Docks, Pier A, Battery Pl., rehabilitating Tiffany Street pier in Hunts Point Section, Bronx Boro, own forces. **$74,000. W.P.A.** funds allotted. Owner and W.P.A. Engineers will supervise and purchase materials.

N. Y., Rochester—AIRPLANE HANGAR—Dpt. P. Wks., City Hall, constructing Hangar 3, on Scottsville Rd., **W.P.A.** labor; Overhead hangar doors with automatic controls, to Swalbach Building Products Co., 961 Lyell Ave. Est. **$200,000.**

N. Y., Rochester—STONE QUARRY—Dpt. P. Wks., City Hall, excavating, breaking and loading rock from stone quarries at Barge Canal, **W.P.A.** forces. **$175,991.** W.P.A. funds allotted. Owner and W.P.A. Engineers will supervise and purchase equipment.

N. Y., Utica—STREET LIGHTING—City, City Hall, erecting additional ornamental lights in James and other streets, own forces. To exceed **$25,000.** Owner will supervise and purchase materials. J. B. Shaw, city engr.

O., Canton—PARK DEVELOPMENT—City, grading, draining, landscaping, constructing drives, shelter houses and recreational facilities for park development in all sections of city, **W.P.A.** labor. **$313,739.** W.P.A. funds. P. Noyes, engr. for Citizens Committee on Parks & Playgrounds.

Okla., Okmulgee — BOAT HOUSE, etc.—City, constructing boat house and pleasure pier at Lake Okmulgee, **W.P.A.** labor. **$30,700.** Private plans.

Pennsylvania—NATURAL GAS DEVELOPMENT—New York State Natural Gas Corp., Box 95, Wellsboro, drilling deep wells, extensive development Oriskany sand natural gas area near Coudersport in Potter Co., separate contracts awarded. Owners taking bids furnishing 4,500 ft. or more 6¼ in. pipe for each well. V. F. Bouyer, in charge. Noted Nov. 18, C.D.—Nov. 25, E.N.-R.

Pa., Bangor—SWIMMING POOL — Borough Council, Borough Hall, constructing 80x120 ft. municipal swimming pool, incl. bathhouse, filtration plant, own forces. Est. **$35,000.** Borough Council takes bids in February furnishing equipment for filtration plant. W, Bintz, 116½ North Washington Ave., Lansing, Mich., engr. Noted Dec. 6, C.D.—Dec. 9, E.N.-R.

†Pa., Erie—BROADCASTING STATION—Div. Purchases & Sales Dpt., Commerce, Wash., D. C., general contract 1 story, 16x28 ft., brick veneer air-way broadcasting station, with radio equipment, to M. E. Souther Co., St. Paul, Minn. Bids Nov. 5. Noted Oct. 18, C.D.—Oct. 21, E.N.-R.

Pa., Oil City—AIRPORT—City, City Hall, additional work at Splane Memorial Airport, incl. completion of hard surface on east-west runway, seeding north-south runway and taxi strips, completion of hangar and relaying portion of drainage system, day labor, under supervision of W. W. Weber, city engr. Est. **$26,700.** Noted Mar. 12, C.D.—Mar. 18, E.N.-R.

Pa., Reading—AIRPORT—City, C. V. Webber, engr., City Hall, additional grading, etc., at municipal airport, own forces under supervision of engineer. **$40,000.** R. E. Kiebach, city purch. agt., will purchase materials and equipment. Noted Nov. 19, C.D.—Nov. 25, E.N.-R.

S. D., Elk Point—ELECTRIC DISTRIBUTION SYSTEM—Union County Rural Power Co., constructing 2nd section about 90 mi. rural electric distribution system in Union Co., to Jensen & Krage, Sioux City, Ia., **$68,986.**

S. D., Union—RURAL ELECTRIFICATION—Union County Rural Power Co., Elk Point, constructing second section 98 mi. line rural electrification, to Jensen & Krage Constr. Co., Sioux City, Ia., **$68,987.**

Texas — MONUMENT BASES — Centennial Division of State Bd. Control, Austin and San Antonio, constructing 19 polished granite monument bases for historical monuments located at various points within state, to Rodriguez Bros., 901 West Houston St., San Antonio, **$42,745.** Est. $75,000. Bids Dec. 9. Noted Nov. 19, C.D.—Nov. 25, E.N.-R.

Tex., Gilmer — RURAL POWER LINES — Upshur Co. Electric Cooperative, c/o W. D. Seals, Gilmer, constructing 80 mi. electric rural power transmission lines in certain parts of Upshur Co., to P. E. Workman, Athletic Club Bldg., Dallas, **$41,587.** Est. $70,000. Bids Dec. 2. Noted Nov. 29, C.D.—Oct. 21, E.N.-R.

Wash., Battle Creek—IMPROVING SCHOOL GROUNDS—School Bd., clearing and improving school grounds, by relief labor. **$48,966.**

Wash., Puyallup — PARK — City, City Hall, improving city park, clearing, landscaping, cleaning pools, repairing buildings, planting, etc., by **W.P.A.** labor. **$38,688.** C. Phillips, city engr.

Wash., Seattle—WHARF IMPROVEMENT—American Can Co., Alaskan Way and Vine St., renewal of piling under wharf, to A. W. Quist Co., Exchange Bldg. Est. **$25,000.**

Wis., Bangor — RURAL ELECTRIC LINE—Town of Bangor, O. S. Fletcher, mayor, and Wisconsin Rural Electric Co-Operative Assn., Madison, constructing 60 mi. rural electric line, to Harold LaPage Co., Inc., Sheboygan, **$47,383.**

Wis., LaCrosse—SWIMMING POOL, etc.—City, general contract swimming pool and bath house, to National Builders, Inc., 2114 Forshay Tower, Minneapolis, Minn., **$41,300** ***plumbing, to G. McKoskey, 1212 Bennett St., LaCrosse, **$22,525*****electrical work, to John Papenfuss, 1003 South 8th St., **$4,997.** Grand total $68,822. Bids Dec. 9. **P.W.A.** Noted Sept. 3, C.D.—Sept. 9, E.N.-R.

B. C., Kamloops—MAGAZINES—Dpt. Natl. Defence, Ottawa, Ont., constructing 4 magazines, to Baynes & Horie Ltd., 846 Howe St., Vancouver, **$21,798.** Awarded Dec. 14.

Ont., Sault Ste. Marie—COAL DOCK—Algoma Central & Hudson Bay Railway, Bay St., reconstructing coal dock on St. Marys River, day labor, **$23,000.** Work started.

MATERIALS, EQUIPMENT

PROPOSED WORK

FIRE TRUCK—**Pueblo, Colo.**—City, G. W. Clark, clk., plans purchasing combination pumper and hose truck in 1938. $15,000.

BOILER—**Port Huron, Mich.**—City Comn. directed E. R. Whitmore, city engr., to prepare specifications for a new boiler for waterworks pumping station.

PUMP — **Goodhue, Minn.** — Village, C. W. Wolfe, clk., plans purchasing 1 pump for water supply. Authorized at Dec. 7 election.

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Materials, etc. (Continued)

TANKS—**St. Louis, Mo.**—Mary F. Fowler, et al, 1529 North 11th St., granted permit by Bd. Pub. Serv., to install two 1,000 gal. underground steel tanks for gasoline for private use, 1527 North 11th St.

TANKS—**St. Louis, Mo.**—F. J. Neumayer, 300 Plum St., granted permit by Bd. Pub. Serv., to install one 3,000 gal. and one 1,000 gal. underground steel tank for gasoline for use in auto filling station, 300 Plum St.

DIESEL ENGINE—**Franklin, Neb.**—City authorized City Engineer to make plans for new diesel engine for power plant. Noted Nov. 30, C.D.—Dec. 2, E.N.-R.

LUMBER, etc.—**Binghamton, N. Y.** — A. Calibrisi, W. P. A. procurement officer, Procurement Div., Telephone Bldg., soon takes bids quantity form lumber for W.P.A. projects; and quantity of cement for various projects.

CAST IRON PIPE—**Brighton, N. Y.**—Town, Town Hall, plans purchasing quantity c.i. pipe for watermain extensions. To exceed $1,000. G. E. Gordon, town clk.

SEWER PIPE—**Greenburgh, N. Y.**—Town, Town Hall, Tarrytown, plans purchasing sewer pipe for replacement and extension of sewer lines in various sections. To exceed $1,000. D. C. Nolan, c/o owner, engr.

CEMENT, etc.—**Hasting-on-Hudson, N. Y.**—Bd. Educ., Hasting-on-Hudson, plans purchasing cement, brick, stone, lumber, trim, etc., for rebuilding School 2. $30,000. **Maturity 1938.** W. R. Shirley, in charge for owners. W.P.A. project.

TANKS, etc.—**Jamestown, N. Y.**—Kendall Refining Co., Bradford, Pa., plans purchasing, installing additional 500 and 1,000 gal. steel tanks, electric pumping equipment, etc., for gasoline service station, 130 Baker St. $1,000 plus. J. B. Fisher, purchasing agt.

TRACTORS, etc.—**North Tonawanda, N. Y.**—City Council plans purchasing tractor and 1 or more trucks. To exceed $10,000.

FIRE HOSE — **Old Forge, N. Y.** — Village, Village Hall, plans purchasing 1,000 lin. ft. new fire hose. $1,500. Special election to be held Jan. 10 to vote on project.

BITUMINOUS MATERIALS, etc.—**Rochester, N. Y.**—Procurement Div., Monroe Co., Rochester, plans purchasing bituminous materials, gravel, etc., for W.P.A. highway work in various villages. To exceed $5,000. **Maturity soon.**

TILE SEWER PIPE—**Rochester, N. Y.**—Div. Purchase & Supply, 36 City Hall, soon purchases large quantities of tile sewer pipe for W.P.A. sewer projects. To exceed $25,000.

SNOW LOADER—**Rome, N. Y.**—Common Council plans purchasing snow loader. To exceed $1,000.

STOKERS — **Utica, N. Y.** — Bd. Supervs. Oneida Co., Court House, plans purchasing 4 new stokers and soot blowers for county buildings. To exceed $10,000. Funds appropriated. F. W. Kirkland, c/o owner, engr.

TURBINE, etc.—**Middletown, O.**—Crystal Tissue Co., Z. W. Ranck, pres., plans purchasing, installing of new 2,000 kw. turbine, incidental condenser, etc., also purchasing, installing new AC motors throughout plant. To exceed $1,000.

ROCK CRUSHER—**Oklahoma City, Okla.**—State Hy. Dpt., Oklahoma City, plans purchasing rock crusher for use at Pawhuska. A. W. Kavanaugh, purch. agt.

PARKING MATERIALS—**Sharon, Pa.**—City Council, plans purchasing, installing 75 additional parking meters in business sections of city. $3,750. **Maturity early in 1938.**

COMBUSTION ENGINE, etc.—**Warren, Pa.**—Allen Drilling Co., F. Allen, mgr., 231 Oneida Ave., abandoned plans for purchase of 85 hp. gas and gasoline drilling engine, $1,800; still in market, however, for 5 h.p. gasoline engine and water pump, $200. Noted Dec. 6, C.D.—Dec. 9, E.N.-R.

PAVING MATERIALS—**Bremerton, Wash.**—City, E. J. McCally, clk., soon takes bids 100,000 sq. yd. concrete paving, $34,486. Work by W.P.A. labor to cost $410,975. C. C. Casad, city engr.

METERS, etc.—**Tacoma, Wash.**—City, G. Martin, clk., Bd. Contr. & Awards, soon takes bids meters and instrument transformers for lighting department, $20,000; and incandescent lamps, $20,000.

FIR PINE, etc.—**Annapolis Royal, N. S.**—F. W. Harris, city clk., interested in prices fir-pine and creosoted hemlock for flume construction 52x700 ft.

BIDS ASKED

†GATE HOISTS — **Arizona** — Jan. 5, by Bureau Reclamation, Denver, Colo., 8 motor-driven double-stem gate hoists for sluice gates and 8 motor-driven, double-stem, gate hoists, for diversion gates for Basin 3 of desilting works of Gila Valley Canal, Gila Project, f.o.b. cars at shipping point or f.o.b. cars at Potholes. Government will install same. R. F. Walter, Custom House, Denver, Colo., engr.

ASPHALTIC CONCRETE BASE, etc.—**Alhambra, Calif.**—City Council, taking bids 4,400 tons asphaltic concrete base, 2,400 tons asphaltic concrete surfacing, 2,[illegible]00 tons premix, alternative bids are to be asked on (a) furnishing and delivering paving materials (b) rent plant to city to furnish materials (c) hauling only.

GYMNASTIC and SWIMMING POOL EQUIPMENT—**Davis, Calif.**—Jan. 31, by Regents of University of California, Berkeley, gymnastic and swimming pool equipment for gymnasium now in course of construction at University Farm. Noted Mar. 18, C.D.—Mar. 25, E.N.-R., under "Public Buildings."

LUMBER—**Oakland, Calif.**—State Procurement Office, U. S. Treas. Dpt., 49-4th St., San Francisco, taking bids 13,600 f.b.m. 4x12 in. x 20 ft. rough #1 common Douglas fir delivered f.o.b. cars Mill or Oakland, Inv. 4756.

†PUMPING OUTFIT — **Pasadena, Calif.**—U. S. Forest Service, Regional Office, 760 Market St., San Francisco, taking bids 1 deep well pumping outfit complete with adjustable gasoline engine mounting, 3 hp. 4 cycle, air cooled gasoline engine, f.o.b. Pasadena, Invitation 1187.

PAVING MATERIALS—**San Jose, Calif.**—City Council taking bids furnishing paving materials for period beginning from date of award of contract to Nov. 30, 1938.

CONCRETE SAND—**San Francisco, Calif.**—State Procurement Office, U. S. Treas. Dpt., 49-4th St., taking bids 270 tons concrete sand, delivered Fort McDowell, Angel Island, Inv. 4755.

†RADIAL GATE HOISTS, etc. — **Denver, Colo.**—Jan. 6, by Bureau Reclamation, Denver, Colo., 3 double-drum radial-gate hoists and 1 portable gasoline-engine-powered drive unit for installation on bridge over spillway at Bull Lake Dam, Riverton Project, Wyo. and 3 double-sprocket, radial-gate hoists and one portable gasoline-engine-powered drive unit for installation on bridge over spillway at Alamogordo Dam, Carlsbad Project, New Mexico, Spec. 1005-D. S. O. Harper, acting ch. engr.

PORTLAND CEMENT, etc.—**Brazil, Ind.**—Jan. 4, by Bd. Comrs. Clay Co., Court House, 1,000 bbl. portland cement; 100,000 ft. bridge lumber; 30 tons structural steel; 1 cement mixer; 2 pumps; 2 industrial type tractors; and 2 auto trucks. J. O. Short, aud.

AUTO TRUCKS—**Covington, Ind.**—Jan. 4, by Bd. Comrs. Fountain Co., Court House, six 2 ton capacity auto trucks. Z. A. Helms, Covington, aud.

TELEPHONE SYSTEM, etc. — **Newcastle, Ind.**—Jan. 7, by Indiana Soldiers & Sailors Orphans Home, L. A. Cortner, supt., selective talking and receiving dial type intercommunicating telephone system, storage batteries, charging apparatus, central switchboard, standard desk and wall, standard commercial design, sets, 50 instruments, 28 extension lines, wiring, rigid conduits. J. M. Rotz Eng. Co., 817 Merchants Bank Bldg., engr.

CRUSHED STONE, PIG LEAD, etc. — **Boston, Mass.**—Jan. 3, by D. F. Doherty, supt. Supply Dpt., City Hall Annex, crushed stone to various city departments as required; Jan. 4, pig lead to Public Works Dpt. and Water Service Dpt.; vit. clay or concrete sewer pipe as required to Sewer Dpt.; portland cement to various city departments as required. To exceed $4,000.

STEEL RAILS—**Detroit, Mich.**—Pere Marquette R.R., General Motors Bldg., Detroit, taking bids 3,500 tons of steel rails.

†DIPPER BUCKET—**Duluth, Minn.**—Jan. 7, by U. S. Eng., Canal Park, Duluth, furnishing 1 dipper bucket 3½ cu. yd. capacity, for U. S. E. D. dredge "Gaillard."

FIRE TRUCKS—**Tracy, Minn.**—Jan. 10, by City, H. M. Algyer, city recdr., 2 new fire trucks (1) complete with 600 gal. per min. triple combination unit with engine of not less than 298 cu. in. piston displacement (2) complete with 200 g.p.m. triple combination rural unit with 250 gal. booster tank and engine of not less than 250 cu. in. piston displacement.

TIMBER PILES, etc.—**Camden, N. J.**—Jan. 6, by Camden Co. Park Comn., F. C. Somers, comptroller, Court House, furnishing approximately 1700 class A timber piles varying in length from 40 to 70 ft.; furnishing 4 work scows together with all appurtenances; one to three steam powered floating pile drivers together with all appurtenances; 2 new or reconditioned, power work boat with all appurtenances; 2 reconditioned full swing caterpillar cranes 70 ft. booms together with all appurtenances, Catharine S. Madra, secy.

SWITCHES, GUARD RAILS, etc.—**Elizabeth, N. J.**—Jan. 14, by Central R.R. of New Jersey, at office A. E. Owen, ch. engr., Jersey City, Terminal, Jersey City, 41 switches, 49 frogs, 128 guard rails, 280 insulated joints, 52 compromise joints, 15 crossings and slip crossings, 4 derails, all in connection with Elizabethport grade crossing elimination; adv. E.N.-R. Dec. 30.

FIRE TRUCK—**Blue Mountain Lake, N. Y.**—See "Contracts Awarded."

TANKS—**Buffalo, N. Y.**—J. Migliore, 728 Niagara St., taking bids purchasing 550 and

Materials, etc. (Continued)

1,000 gal. steel gasoline storage tanks and pumping equipment at gasoline service station, Georgia and 7th Sts. To exceed $1,000. **Maturity at once.**

INCINERATOR — **Hudson, N. Y.** — State Dpt. Social Welfare, 112 State St., Albany, taking bids furnishing an incinerator for State Training School. To exceed $5,000. W. E. Haugaard, State Bldg., Albany, archt.

STEEL PIPE—**New York, N. Y.**—The Texas Co., 135 East 42nd St., New York, N. Y., taking bids 23,000 tons 12¾ in. steel pipe for export to Columbia, South America pipe line project.

INVERT PIPE, etc.—**Rochester, N. Y.**—Div. Purchase & Supply, City Hall, taking bids furnishing quantity full coated, paved, invert pipe, 1,760 lin. ft., ⅜ in. plate and 352 plates, for Dpt. P. Wks. To exceed $1,000.

LIGHTING EQUIPMENT—**Utica, N. Y.**—Bd. Supervs. Oneida Co., Court House, taking bids purchasing lighting equipment. $1,000.

TRANSFORMERS, etc.—**Westfield, N. Y.**—Bd. Village Trustees, Village Hall, taking bids transformers, generators and other equipment for improving municipal light and power system. $35,000. H. Mettendorf, Village Hall, supt.

DIESEL OIL ENGINE—**Wagoner, Okla.**—City Council in market for 25 hp. diesel oil engine for water plant. C. Higginbotham, supt.

WIRE, POLES, etc.—**Butler, Pa.**—Miller Baxter Co., Inc., 446 North Penn St., Indianapolis, in market for poles, insulators, wire and other equipment for 425 mi. rural electric power line in Butler and Armstrong Counties. To exceed $1,000.

†MANILA ROPE—**Phila., Pa.**—Jan. 4, by U. S. Marine Corps. Depot, 85,000 lb. ¼- to 1-in. manila rope. To exceed $1,000.

†TRANSMISSION TOWERS — **Knoxville, Tenn.**—Jan. 6, by Tennessee Valley Authority, Knoxville, designing, furnishing, fabricating, galvanizing, selling and delivering single circuit steel transmission towers and accessories, for Watts Bar-Alcoa 154 k.v. transmission line. C. H. Garity, dir. Purchases.

†DISCONNECTING SWITCHES—**Knoxville, Tenn.**—Jan. 7, by Tennessee Valley Authority, Knoxville, designing, selling, furnishing delivering 161 k.v. disconnecting switches for Guntersville Switchyard. C. H. Garity, dir. Purchases.

GENERATING UNIT—**Vernon, Tex.**—Jan. 11, by City, H. D. Hockersmith, mayor, one Diesel electric generating unit to be between 750 h.p. and 1,000 h.p. or nearest standard size, to be installed in municipal power plant.

CONTRACTS AWARDED

†PORTLAND CEMENT — **Arizona**—Bureau Reclamation, Denver, Colo., furnishing, delivering 160,000 bbl. low heat portland cement for Parker Dam, Parker Dam Project, Spec. 977-D, to Monolith Portland Cement Co., 215 West 7th St., Los Angeles, **$178,800.** Bids Oct. 13. Noted Sept. 28, C.D.—Sept. 30, E.N.-R.

CREOSOTED POLES—**Los Angeles, Calif.** Dpt. Water & Power, D. P. Nicklin, purch. agt., 207 South Bway., Douglas fir creosoted poles, Spec. 2411, to Southern California Roads Co., 2145 East 25th St., **$11,750.** Bids Sept. 27, awarded Dec. 24.

†FABRICATED STEEL—**Los Angeles, Calif.** —U. S. Eng., 751 South Figueroa St., 45,000 lb. fabricated steel for Sewer Farm Road and traffic supports, Proposal 150, to Kyle Steel Constr. Co., 5555 Magnolia St., Vernon, **$2,236.** Bids Dec. 12, awarded Dec. 16. Noted Dec. 8, C.D.

GALVANIZED PIPE SECTIONS—**Los Angeles, Calif.**—Metropolitan Water Dist., F. E. Weymouth, engr., 306 West 3rd St., galvanized pipe sections for interior fire, water and cooling systems, Bid 91757, to Southwest Welding & Mfg. Co., 3201 West Mission Rd., Alhambra, **$6,534.** Bids Dec. 2, awarded Dec. 13.

NON-FERROUS FITTINGS — **Los Angeles, Calif.**—Metropolitan Water Dist., 306 West 3rd St., F. E. Weymouth, engr., non-ferrous fittings for switch house equipment and power cable, Colorado River Aqueduct, Bid 91750, to Railway & Industrial Eng. Co., 357 South Hill St., **$5,172.** Bids Nov. 30, awarded Dec. 13.

STEEL TUNNEL RIBS, etc.—**Los Angeles, Calif.**—D. P. Nicklin, purch. agt., Dpt. Water & Power, 207 South Bway., steel tunnel ribs and spreaders as required for 1 year, Spec. 2465, to Bethlehem Steel Co., East Slauson Ave., Vernon, est. **$85,440;** 150 steel spreader sets, Spec. 2479, to Consolidated Steel Co., 6700 South Eastern Ave., **$3,468.** Bids Dec. 10, awarded Dec. 14. Noted Dec. 2, C.D.

†STRUCTURAL STEEL—**Los Angeles, Calif.** —U. S. Eng., 751 South Figueroa St., 315,000 lb. fabricated structural steel f.o.b. Milwaukee, Wis., for Duquesne Ave. Bridge over Ballona Creek, Proposal 143, to Wisconsin Bridge & Iron Wks., 5023 North 35th St., Milwaukee, Wis., **$16,695.** Bids Dec. 8, awarded Dec. 15. Noted Dec. 3, C.D.

†STRUCTURAL STEEL—**Los Angeles, Calif.** —U. S. Eng., 751 South Figueroa St., 170,000 lb. structural steel for Pacific Electric Railway bridge over Ballona Creek, Proposal 152, to Wisconsin Bridge & Iron Wks., 5023 North 35th St., Milwaukee, Wis., **$9,282.** Bids Dec. 14. Noted Dec. 8, C.D.

AGGREGATE, etc.—**Petaluma, Calif.**—G. Roberts, city clk., 552 tons coarse and 250 tons fine aggregate to Hein Bros. Basalt Rock Co., Box 162, **$1.60** and **$1.80** per ton respectively; 1,025 sacks portland cement, to Sterling Lumber Co., 411-3rd St., **62.5c** per sack; 1,652 bars ½ in. round reinforcing steel, 20 ft. lengths, 660 bars ½ in. reinforcing steel 23 ft. 8 in. lengths, 660 bars ½ in. reinforcing steel, 22 ft. 4 in. lengths, 24 bars round reinforcing steel, 24 ft. lengths, to Diamond Match Co., 101 East Washington St., **$1,437** net. Noted Dec. 8, C.D.—Dec. 16, E.N.-R.

†STONE, SAND, etc.—**San Bruno, Calif.**—State Procurement Office, U. S. Treas. Dpt., 49-4th St., San Francisco, 50 tons 2½- to 1-in. crushed stone for macadam pavement, 50 tons 1½ to ½ in. same, 50 tons same uniformly graded between ¾ in. and 1-in. mesh, 20 tons concrete sand, 50 tons gravel for ditches, Inv. 4728, to South City Lumber & Supply Co., Railroad and Spruce Sts., South San Francisco, **$415.** Bids Dec. 9. Noted Dec. 13, C.D.—Dec. 16, E.N.-R.; 560 lin. ft. 18 in. and 147 lin. ft. 16 in. I.D. concrete pipe, delivered Hillside Dr. and Cortez Ave., Burlingame, Inv. 4713, to San Jose Concrete Pipe Co., 590 Stockton Ave., San Jose, **$600.**

ASPHALTIC CONCRETE WEARING SURFACE—**San Francisco, Calif.**—T. A. Brooks, city purch. agt., City Hall, 4,500 tons asphaltic concrete wearing surface for WPA projects, Bid 1945, to Pacific Pavements Co., 85 Barstow St., **$15,000.** Noted Dec. 13, C.D.—Dec. 16, E.N.-R.

CHAIN LINK FENCING—**San Francisco, Calif.**—State Procurement Office, U. S. Treas. Dpt., 49-4th St., 1,000 lin. ft. chain link fencing, 18 ft. height, incl. line posts and line post tops at 10 ft. spacings and other units at various heights, Inv. 4736, to Standard Fence Co., 440 Bayshore Blvd., **$1,226** net. Noted Dec. 15, C.D.—Dec. 23, E.N.-R.

†LUMBER, etc.—**San Francisco, Calif.**—State Procurement Office, U. S. Treas. Dpt., 49-4th St., redwood and Douglas fir lumber, delivered 34th Ave. and Lincoln ay, Inv. 4725, to S. F. Lumber Co., Beach and Powell Sts., **$589.** Noted Dec. 10, C.D.—Dec. 16, E.N.-R.***26,667 FBM No. 1 common Douglas fir SISIE, Inv. 4723, to Smith Lumber Co., 4th and Channel Sts., **$298.** Noted Dec. 8, C.D.—Dec. 16, E.N.-R.***Persian Green and Blue tiles, white cold, dark green and white tiles for Aquatic Park, Beach and Larkin Sts., Inv. 4730, to Solon and Larkin, San Jose, **$585** (this is a partial bid). Grand total $1,472.

METER BOXES, etc.—**San Francisco, Calif.** —T. A. Brooks, city purch agt., City Hall, concrete meter boxes, frames and lids for San Francisco Water Dpt. from Jan. 1, 1938 to Dec. 31, 1938, Bid 1937, to Art Concrete Works, 25th and Adeline Sts., and G. Forni, 1379-62nd St., Oakland, about **$10,000.** Bids Dec. 10. Noted Dec. 2, C.D.

PAVEMENT BREAKERS, etc.—**San Francisco, Calif.**—State Procurement Office, U. S. Treas. Dpt., 49-4th St., furnishing 5 pavement breakers, 12 steel asphalt cutters, steel gads, chisels, delivered 1155 Page St., Inv. 4724, to Sullivan Mchy. Co., 145-10th St., **$1,263** net. Noted Dec. 8, C.D.—Dec. 16, E.N.-R.

REINFORCING STEEL BARS—**San Francisco, Calif.**—State Procurement Office, U. S. Treas. Dpt., 49-4th St., 25,800 lin. ft. ½ in. deformed reinforcing steel bars, 4,040 lin. ft. ½ in. and 5,600 ft. ⅞ in. round deformed reinforcing steel bars, Inv. 4721, to Herrick Iron Wks., 18th and Campbell Sts., Oakland, **$1,159.** ½% 20 days. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

STEEL RAILS—**San Francisco, Calif.**—Western Pacific R.R., Mills Bldg., 22,000 tons steel rails, to Columbia Steel Co., Russ Bldg., and Colorado Fuel & Iron Corp., Pueblo, Colo.

CEMENT—**Wash., D. C.**—Procurement Div., Treas. Dpt., Wash., D. C., cement for various W.P.A. projects in Buffalo and vicinity, to W. S. Crooker & Son, Inc., 325 West Genesee St., Buffalo, N. Y., and to Lehigh Portland Cement Co., Liberty Bank Bldg., Buffalo, N. Y., **$99,500.** Est $100,000.

†TRANSFORMERS, etc. — **Idaho** — Bureau Reclamation, Denver, Colo., furnishing, delivering two 2,000 kva, 2,300 to 19,050/3,000 Y-volt, three-phase, 60-cycle, oil immersed, self-cooled outdoor type transformers, two 34,500 volt, 600-ampere, oil circuit breakers, eighteen 34,500 volt, 600-ampere disconnecting switches for Minidoka Power Plant, Minidoka Project, Spec. 985-D, Item 1, to Pennsylvania Transformer Co., 1701 Island Ave., Pittsburgh, Pa., **$13,520*****Item 2, to Kelmen Electric & Mfg. Co., 1650 Naud St., Los Angeles, Calif., **$8,113*****Item 3, to High Tension Co., Phillipsburg, N. J., **$779.** Grand total, $22,412. Bids Nov. 10. Noted Nov. 22, C.D.—Oct. 28, E.N.-R.

STEEL RAILS — **Chicago, Ill.** — Northern Pacific R.R. Co., B. Blum, ch. engr., St. Paul, Minn., and Union Station, Chicago, Ill., furnishing 200,000 tons steel rails, to Carnegie-Illinois Steel Co., Carnegie Bldg., Pittsburgh, Pa.***9,000 tons steel, to Bethle-

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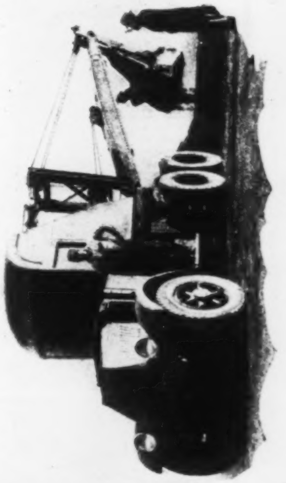

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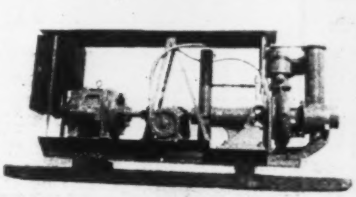

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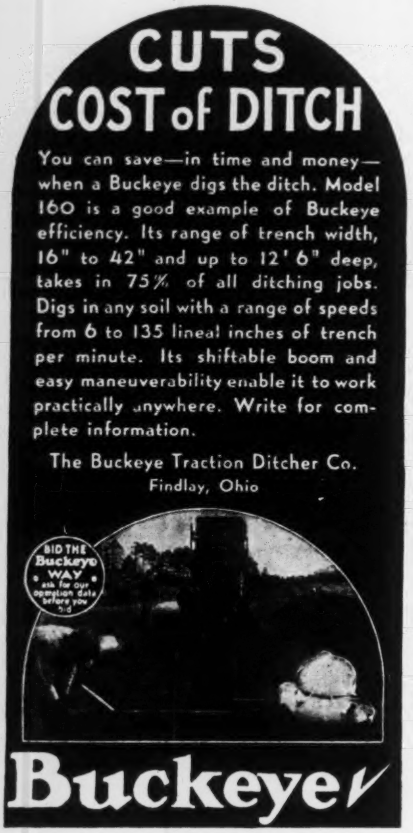

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Materials, etc. (Continued)

hem Steel Co., Bethlehem, Pa.***and 1,000 tons, to Colorado Fuel & Iron Co., Pueblo, Colo.

DUMP BODIES—**Ames, Ia.**—State Hy. Comn., Ames, eleven 1 1/5 cu. yd. dump bodies, to Des Moines Steel Co., 421 Southwest 4th St., Des Moines, **$2,390.** Bids Dec. 9, awarded Dec. 14. Noted Dec. 3, C.D.

RAILROAD SIGNALS—**Ames, Ia.**—State Hy. Comn., Ames, furnishing 16 type B or C flashing light highway-railroad crossing signals all with rotating stop sign, 1 with additional lights and special shield and 2 type A flashing light highway-railroad crossing signals, to Western Railroad Supply Co., 2360 South Ashland Ave., Chicago, Ill., **$7,173.** Bids Dec. 7. Noted Nov. 30, C.D.—Dec. 2, E.N.-R.

LUMBER—**Clarinda, Ia.**—Page Co., G. F. Mitchell, aud., 32,400 ft. B.M. creosoted fir or yellow pine lumber, 19,200 ft. B.M. fir lumber S4S; 97,100 ft. B.M. rough fir lumber; and 10,200 lin. ft. creosoted piling, to Nebraska Bridge Supply & Lumber Co., 730 Union State Bank Bldg., Omaha, Neb., **$11,235.** Bids Dec. 16. Noted Nov. 29, C.D.—Dec. 2, E.N.-R.

†AIRPORT RADIO EQUIPMENT—**Boston, Mass.**—Dpt. Commerce, Bureau Aviation, Wash., D. C., radio equipment for airport improvement, to Westinghouse Electric & Mfg. Co., 150 Bway., New York. Est. exceeds **$5,000.**

CAST IRON PIPE—**Lincoln, Mass.**—Village, 175 tons 12 in. c.i. pipe for water mains, to Warm Fdry. & Pipe Co., Everett. Noted Sept. 15, C.D.—Sept. 23, E.N.-R.

†LEAD CABLE—**Watertown, Mass.**—Commanding Officer, Watertown Arsenal, furnishing 4,234 ft. lead cable, to American Electric Supply Co., 1040 Trenton St., Boston, Mass., **$1,400.**

SNOW PLOWS—**Michigan**—State Administrative Bd., Administration Bldg., Lansing, 52 "Ross" R7-21 Junior one-way snow plows for 1½ ton trucks, to Contractors Mchy. Co., 16425 Hamilton St., Detroit, **$15,535.** Bids Sept. 22. Noted Sept. 16, C.D.

LUMBER—**Minneapolis, Minn.**—City, F. S. Gram, city purch. agt., 18,000 bd. ft. lumber for use in manual training departments, for Bd. Educ., to Northwestern Hardwood Co., 525 Lumber Exchange, **$1,722.** Bids Nov. 30. Noted Nov. 24, C.D.

BOILER—**Yazoo City, Miss.**—City, c/o Public Serv. Comn., furnishing, constructing and erecting 1 boiler at municipal light plant on foundations furnished by city, to Riley Stoker Corp., Worcester, Mass., **$43,500.** Est. $40,000. Bids Dec. 10, awarded Dec. 16. Noted Dec. 7, C.D.

†RELAY BOARD—**Boulder City, Nev.**—Bureau Reclamation, Denver, Colo., furnishing relay board for installation 230 k.v. switchboard at Boulder Power Plant, Boulder Canyon Project, Spec. 976-D, to Square D Co., 724 West Colfax Ave., Denver, Colo., **$1,237.** Bids Oct. 7. Noted Sept. 21, C.D.—Sept. 23, E.N.-R.

†STEEL for BUS TOWER, etc.—**Boulder City, Nev.**—Bureau Reclamation, Denver, Colo., furnishing structural steel for 4 bus towers, 1 centre take-off structure, and 2 lightning arrester supports for Southern California Edison Co. switching station and transformer circuits at Boulder switchyard, Boulder Canyon Project, Arizona-California-Nevada, Spec. 989-D, to Lehigh Structural Steel Co., 16 Bethune St., New York, N. Y., **$6,410.** Bids Nov. 29. Noted Nov. 15, C.D.—Nov. 18, E.N.-R.

†AIRPORT RADIO EQUIPMENT—**Elizabeth, N. J.**—Dpt. Commerce, Bureau of Aviation, Wash., D. C., furnishing radio equipment for airport improvement, to Westinghouse Electric & Mfg. Co., 150 Bway., New York. Est. exceeds **$5,000.**

WROUGHT IRON—**Trenton, N. J.**—F. A. Brodesser, State Purchasing comr., 5,500 ft. 1- to 2½-in. wrought iron galvanized electrical conduits, to Hajoca Corp., 1697 Haddon Ave., Camden, **$2,123.** Bids Dec. 15, awarded Dec. 20.

†AIRPORT RADIO EQUIPMENT—**Albany, N. Y.**—Dpt. Commerce, Bureau Aviation, Wash., D. C., radio equipment for airport improvements, to Westinghouse Electric & Mfg. Co., 150 Bway., New York. Est. exceeds **$5,000.**

FIRE TRUCK—**Blue Mountain Lake, N. Y.**—Village, purchasing chassis and equipment and assembly of fire truck, to have motor powered water pump, hose, and other appliances, with own forces, **$4,500.**

†COPPER TUBING—**Brooklyn, N. Y.**—Yards & Docks, Navy Dpt., Wash., D. C., copper tubing delivered to Navy Yard, to Bridgeport Brass Co., 774 East Main St., Bridgeport, Conn., **$100,248.**

†PORTLAND CEMENT—**Brooklyn, N. Y.**—Yards & Docks, Navy Dpt., Wash., D. C., furnishing portland cement to Brooklyn Navy Yard, to Edison Cement Corp., New Village, **$20,462.** Est. $25,000.

†AIRPORT RADIO EQUIPMENT—**Buffalo, N. Y.**—Dpt. Commerce, Bureau Aviation, Wash., D. C., radio equipment for airport improvement project, to Westinghouse Electric & Mfg. Co., 150 Bway., New York. Est. exceeds **$5,000.**

TRUCK—**Oneonta, N. Y.**—Bd. Pub. Serv. truck for Dpt. P. Wks., to Ohmeis Chevrolet Co., Oneonta, **$1,336.** Est. $1,500. Noted Dec. 16, C.D.—Dec. 23, E.N.-R.

VITRIFIED CLAY TILE—**Schenectady, N. Y.**—Contract & Supply Com., City Hall, 15 and 24 in. tile storm sewer pipe, to Kellam-Shaffer Co., Maxon Rd., **$1,424.** Bids Dec. 10. Noted Dec. 8, C.D.—Dec. 16, E.N.-R.

LUMBER—**Syracuse, N. Y.**—Procurement Div., Treas. Dpt., Old Post Office Bldg., furnishing lumber for Ley Creek Sewage Disposal Plant, to Paragon Plaster Co., West Water St., and to Cotton & Hanlon, Cortland. Est. exceeds **$2,000. W.P.A.**

TRACTORS—**Yonkers, N. Y.**—Bd. Contr. & Supply, City Hall, furnishing tractor with snow plow of V type attached, to H. O. Penn Mchy. Co., R.R. and 140th St., New York, **$12,665.** Noted Dec. 9, C.D.—Dec. 16, E.N.-R.

†PENSTOCK and DISCHARGE PIPE—**Oregon**—Bureau Reclamation, Dpt. Interior, Denver, Colo., furnishing, delivering plate-steel penstock and discharge pipe and appurtenances for installation at Succor Creek Pumping Plant, Owyhee Project, Spec. 991-D to Beall Pipe & Tank Corp., 1945 North Columbia Blvd., Portland, **$1,118.** Bids Nov. 24. Noted Nov. 15, C.D.—Nov. 18, E.N.-R.

†RADIAL GATES—**Washington**—Bureau Reclamation, Denver, Colo., furnishing, delivering two 13 ft. 4 in. x 12 ft. radial gates and two 7,500 lb., double-drum, motor-driven radial gate hoists, for installation at inlet at Pomona siphon, Yakima Ridge Canal, Roza Division, Yakima Project, Spec. 993-D. Items (1) to J. W. Beam, Guardian Vault Bldg., Denver, Colo., **$1,410 (2)**, to Valley Iron Wks., Yakima, **$2,370.** Bids Dec. 1 Noted Nov. 18, C.D.

TRACTOR—**Pasco Wash.**—Franklin Co. E. F. Redd, aud., tractor, diesel, full truck laying type, to Webb Tractor & Equipment, 311 South 1st St., Yakima, **$2,445.** Bids Dec. 7. Noted Nov. 24, C.D.

BOOSTER and HOSE WAGON—**Spokane, Wash.**—City Council, City Hall, one 750 gal. triple combination booster and hose wagon for Fire Dpt., to Kenworth Motor Truck Corp., 1263 Mercer St., Seattle, **$8,377.** Bids Dec. 2, awarded Dec. 7.

COPPER WIRE—**Tacoma, Wash.**—Bd. Contr. & Supply, City Hall, 15,000 lb. No. 6, 15,000 lb. No. 4 and 5,000 lb. No. 2 copper wire, to Graybar Electric Co., 1214 A St., **$6,652.** Bids Dec. 13. Noted Dec. 9, C.D.

PIPE, etc.—**Tacoma, Wash.**—Bd. Contrs. & Awards, City Hall, 8,300 ft. 48 in. and 12,000 ft. 36 in. electrical welded steel pipe with fittings, and coal tar enamel coating throughout, to Hydraulic Supply Mfg. Co., 7500 8th Ave. S., Seattle, **$122,762;** 12 gate valves, to Pacific Waterworks Supply Co., Atlantic Street Dock, Seattle, **$5,202.** Bids Dec. 6. Noted Nov. 22, C.D.

PIPE, etc.—**Vancouver, Wash.**—City, pipe for water supply system, to U. S. Pipe & Fdry. Co., Colman Bldg., Seattle, **$27,729;** valves, to Rensselaer Valve Co., Artic Bldg., Seattle, **$8,526.** Est. $26,000. Bids Dec. 6 Noted Nov. 24, C.D.

†REINFORCING STEEL—**Yakima, Wash.**—Bureau Reclamation, Dpt. Interior, Custom House, Denver, Colo., furnishing reinforcing steel for Roza Project, to Knoxville Iron Co., Knoxville, Tenn., **$61,978.** Bids Nov. 8. Noted Nov. 5, C.D.

TAR KETTLE, etc.—**Appleton, Wis.**—City furnishing tar kettle to Mid-West Equipment Co., 734 West Virginia St., Milwaukee, **$202;** stokers, to Boehck Equipment Co., 2404 West Clyborn St., Milwaukee, **$859.** Bids Nov. 23 Noted Nov. 18, C.D.

PUMP, etc.—**Madison, Wis.**—Procurement Div., Treas. Dpt., Madison, deep well turbine pump for Rhinelander, to Madison Mechanical Eng. Co., Madison, **$371;** lighting control board and relays for Greendale, to United Electric Controls Corp., 35 River St., Hoboken, N. J., **$3,553.** Awarded Dec. 20.

LUMBER—**Milwaukee, Wis.**—Milwaukee Co., to J. C. Wendell, 720 North Jefferson St., 100,000 ft. 4/4 common and selected oak, **$41** per 1,000; 2 cars 1½x1½x19 clear red oak at **$46** per 1,000; and 2 cars 2x2x19 clear red oak at **$52** per 1,000***to General Lumber Co., 757 North Bway., 20,000 ft. 4/4 No. 1 common and select gray elm, **$42.50** per 1,000***to W. Kelley, 735 North Water St., 20,000 ft. 5/4 No. 1 common and select gray elm, **$47.50** per 1,000. Bids Dec. 20. Noted Dec. 14, C.D.

REPORTS FROM ABROAD

Australia—Government of State of Victoria, **Melbourne,** voted $43,750,000 to State Electricity Commission for extensions, increasing generating capacity by 200,000 kw. **Plans for 50,000 kw. increase at Yallorne** and 30,000 kw. at Newport, will be called early **in 1938, and for constructing 2 circuit** 165,000 volt transmission line on steel towers from headwaters of River Kiewa to Melbourne 160 mi., also for 66,000 volt line to Wangaratta will be called in spring***Imperial Chemical Industries Australia, Ltd., Reports From Abroad (Continued)

Yarraville, plans factory, $1,000,000***Commonwealth Aircraft Corp., Ltd., **Melbourne,** plans extending aeroplane factory. $600,000.

Cyprus, Nicosia—Municipality, in conjunction with Colonial Office, drawing plans for piping water from base of Northern Kyrenia range to Nicosia for 10 mi. $583,000.

England—Hopkiss Bros. Ltd., Engineering Works, 21 New John St., **Blackheath,** preparing plans constructing works extension and will be in the market for considerable forging equipment, $600,000***J. H. P. Cronin, archt., 65 Coventry Rd., **Coleshill,** preparing plans factory for Airlite Trailer Co., Ltd., Old Meteor Wks., Coventry, $550,000.

England—H. Whiteman, archt., 28 Priory Row, **Coventry,** preparing plans housing development on Grange Estate, $900,000***J. W. Beaumont & Son, 53 Spring Gardens, **Manchester,** preparing plans 7 story, block department store for Kendal Miles Co., Harrods, Ltd., Deansgate, $930,000***Birmingham Small Arms Co., Ltd., Small Heath, **Birmingham,** making plans new factory, $900,000 and workmen's dwelling, $1,750,000***C. E. M. Fillmore, Colmore Row, **Birmingham,** preparing plans municipality building for Borough Council, of Bromwich, $725,000***County Council, Gloucestershire, **Stroud,** voted $500,000 for constructing mental Institution $725,000***F. A. Browne, archt., The Castle, preparing plans for building for Chester County Council, **Chester,** $844,875 voted***E. Dawson, archt., 49 Deansport, **Manchester,** preparing plans housing erection on Gatehouse Estate for W. Campion, $580,000***Corporation Hospital Committee, **York,** constructing municipal hospital addition, to F. Shepherd & Sons, Ltd., Bridge Lane, York, $593,498***Clark & Sillicoe, 28 Trinity Churchyard, **Rugby,** preparing plans 334 house erection for Bilton Place Estates, Ltd., $814,000*****Chorley** Municipality, constructing reinforced concrete viaduct, to Sir Lindsay Parkinson & Co., Ltd., Blackpool, $590,000***County Council of Essex, **Chelmsford,** plans by K. Stuart, County Bldg., archt., constructing Convalescent Hospital, $503,420 voted***Henry Hore & Sons, Ltd. (window manufacturers) Halford Works, Smethwick, preparing plans erecting plant on 40 acre site, **Birmingham,** $600,000***North Eastern Housing Association, Ltd., **Sunderland,** constructing 720 house erection, to J. W. Evans & Co., Ltd., South Halton, $1,485,000***Gordon Kenworth, **Oldham,** preparing plans for housing development at Springhead, for Dixon Hill Co., Ltd., $750,000***Corporation Housing Committee, **South Shields,** erecting 692 houses on Horsley Hill, to G. Bailey Co., Ltd., 16 King St., $1,450,000***London, Midland & Southern Ry., **Longport,** preparing plans new depot, $580,000 ***Surrey County Council, **Kingston-on-Thames,** plans constructing nurses home at County Hospital, $596,000 voted***Wilfrid Rhodes, archt., 26 Parsonage Rd., **Manchester,** preparing plans for 214 houses on Snipe Estate for Pine Estates Ltd., $595,000.

England—Urban District Council, **Harrow,** voted $1,549,875 for constructing 476 flats and 132 houses on Rayners Lane. Bids in January***Trent Valley & High Peak Electricity Co., Ltd., **Whaley Bridge,** making plans extensions, $575,000***Ministry of War preparing plans constructing barracks on **Newcastle-on Tyne, $750,000*****Co-Operative Wholesale Society Ltd., **Birtley,** purchases site for constructing tinplate works, $750,000***Corporation Housing Committee, purchases Breightmet House Estate, **Bolton,** and plans housing development, $850,000***Jessop Hospital Administration, **Sheffield,** making plans extension, $750,000***Burgess, Holden & Watson, archts., 7 Station Approach, Beaconsfield, preparing plans warehouse building on Bellevue Ave., **Hendon,** $650,000***West Hampshire Electricity Co., Ltd., **Soberton,** making plans extensions, $600,000*****Heysham** Municipality making plans concert hall, etc., on Promenade, $500,000***Co-Operative Wholesale Society Ltd., **Birmingham,** making plans cabinet factory at Solhull, $500,000 and will purchase machinery.***Corporation Housing Committee, **Bootle,** making plans and takes bids in March for 2,000 houses, $5,000,000***J. Bennett, archt., 4 Woodville Terrace, **Gravesend,** preparing plans municipality for fire and police headquarters building, $579,700***Central Electricity Board, **Rayleight,** making plans extension scheme, $750,000*****Derby,** Municipality voted $1,755,750 for installing boiler units and turbo-alternators set at municipal power plant*****Morecambe** Municipality voted $2,000,000 for development and widening West End Promenade, by day labor***Jackson & Greenen, archts., Hinton Bldg., Hinton Rd., **Bournemouth,** preparing plans hotel at Kingsway Hove, $1,000,000***Corporation Housing Committee, **Manchester,** plans housing construction on Openshaw Estate. Plans ready in January***Corporation Housing Committee, **Birmingham,** making plans housing construction at Sheldon, $1,000,000*****Peterborough** Municipality plans water supply augmentation scheme. Bids early in January, $590,000 voted ***Bedford, Huntshire & Cambridge Electricity Co., Ltd., **Fulborne,** making plans extensions, $750,000. Maturity early in 1938*** **Gloucester** Municipality making plans constructing Westgate Bridge, $590,000. Private plans.***Trustees of W. Platts, **Bingley,** making plans housing development on Crow Nest Estate, $600,000***Corporation Housing Committee, **Newcastle-on-Tyne,** voted $1,215,000 for housing construction. Plans available in February***Urban District Council, **Bedlington,** making plans housing development at Choppington, $500,000*****Manchester** Municipality voted $1,250,000 for watermain extensions. Plans ready in February***Urban District Council, **Edmonton,** making plans housing development at Enfield, $590,000***City Engineer, Birmingham, bids in January, constructing covered service reservoir at Perry Bar, $575,000***Ministry of War, preparing plans armory construction on Dykelands Road, **Sunderland,** $750,000***Corporation Housing Committee, **Sunderland,** making plans constructing 1,016 houses at Springwell Farm Estate, $3,500,000***Corporation Housing Committee, **Bath,** plans constructing 424 houses on Whiteway Estate, $1,324,605***Devon General Omnibus & Touring Co., Ltd., Newton Rd., **Tiverton,** making plans bus garage and Central Depot, $600,000***Wood, Kendrick & Reynolds, archts., 37 Colmore Row, **Birmingham,** making plans amusement hall, for Ramsgate Olympic Ltd., $550,000***Ebruite Corrugated Container Ltd., **Doncaster,** bids soon for factory, $500,000***County Council of Middlesex, **Enfield,** constructing technical institute, to Kent & Sussex Building Co., Ltd., Ideal House, Carleton Rd., Erith, $590,000*** General Motors Co., Ltd., King George Fifth Graving Dock, **Southampton,** making plans plant, $750,000***International Harvester Co. of Great Britain, Ltd., **Doncaster,** making plans plant at Whealty Park, $1,000,000*** **Birmingham** Municipality, reconstructing Edmund St., by day labor, $675,000.

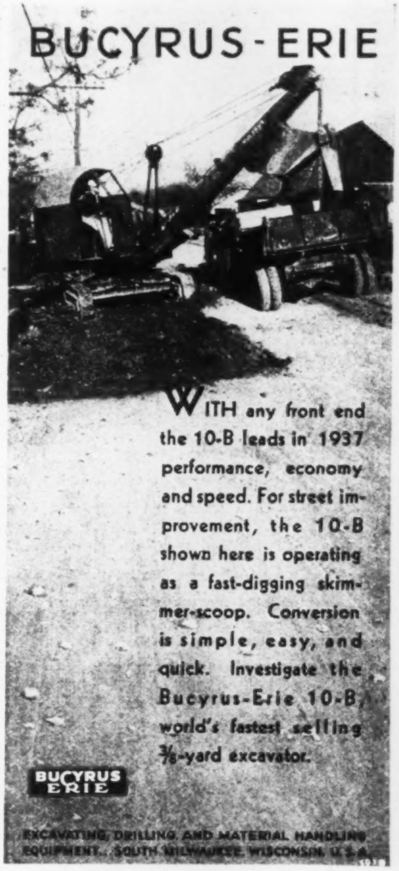
England, Liverpool — Church of England plans by Sir Giles Scott, archt., constructing cathedral here, $10,000,000; Roman Catholic Diocese, plans by Sir Edwin Lutyens, archt., for cathedral, $15,000,000.

England, Liverpool — Corporation Housing Committee, bids in February, for constructing 533 houses on Avison St., $1,450,000*** Robert Gregory & Co., Ltd., making plans plant and in market for machinery, $600,000 ***H. C. Killender, archt., 62 Dale St., preparing plans new works for Summer Eng. Co., Fairfield St., $750,000.

England, London — Thompson & Walford, Leadenhall Bldg., Leadenhall St. E.C., preparing plans college addition for Governors and Senate of University of London, $700,000 ***Lanchester & Lodge, archts., 19 Bedford Square W.C., preparing plans extension to St. Bartholomew Hospital, $600,000***London County Council, constructing 400 houses on Chingford Estate, to Unit Construction Co., Ltd., 1 Robert St., Adelphi, W.C., London, $1,450,000 *** County Council of Middlesex, reconstructing Great West Road, to Fitzpatrick & Son, Ltd., 455 Old Bow Rd., Bow East, London, $522,070***A. Ornatin, Ltd., 2 Plough St., Whitechapel East, making plans constructing factory on 2 acre site at Beecontree, $750,000 *** Lee Conservancy Bd. making plans drainage and flood prevention scheme, $1,000,000***Guildhall Development Co., Ltd., 19 Grosvenor Pl. S.W., preparing plans factory at Brentford, $1,000,000***J. Maclaren Ross, archt., 11 Victoria St., Westminster S.W., preparing plans paper manufacturing plant at Hulme, $790,000***L. C. Norton, archt., 45 Albermarle St. West, preparing plans theatre, car park, etc., on Baker St., for J. Davis, Ltd., $600,000***London County Council voted $2,675,000 for constructing 15 blocks of flats on Mill End Road. Plans ready late in January*** Imperial Chemical Industries, Millbank, Westminster S.W., preparing plans chemical plant at Bellshill, $1,000,000***Borough Council of Woolwich voted $584,000 for constructing 198 houses on Horn Park Estate***Allnatt Co., Ltd., Chase Estate, Park Royal N.W., preparing plans factory at Alperton, $1,000,000 ***Borough Council of St. Marylebone, plans by K. M. B. Cross, 46 New Bond St. West, for large electrical distribution station *** London County Council voted $830,000 for widening Bishopsgate, by day labor***British Domalac Co., Ltd., plans by R. Kevan, 163 Eltham St. S.E., plant addition, on Harrow Manor Way, $500,000***London County Council making plans and takes bids in February for constructing airport on 1,000 acre site at Ilford, $2,999,250 voted***Ministry of War preparing plans barracks at Denham, $750,000***Tunnel Asbestos Cement Co., Ltd., Horseferry House, Westminster S.W., making plans plant at West Thurrock, $1,500,000***Wates & Co., Ltd., 1258 London Rd., Norbury S.W., preparing plans housing erection at Baker St., $525,000***Kennedy & Donkin, 14 Bway. Court S.W., preparing plans for municipal electrical development at Finchley, $750,000. Plans ready early in 1938 *** Borough Council of Hammersmith, constructing city hall, to Allen Fairheads & Sons, Ltd., Sydney Rd., Enfield, $1,097,705. E. B. Webber, 42 Gordon Square, Bloomsbury W.C., archt.***Charles Hammerton & Co., Ltd., 21 Stockwell Green S.W., making plans brewery on Lingham St., $800,000.

Federated Malay States — Office High Commissioner, **Ipeh,** preparing plans 1,000 patient hospital, $2,000,000 available***at office High Commissioner, **Teluk Anson,** preparing plans new government building, $500,000.

Palestine, Jerusalem — Office of Mandatory Commission making plans irrigation scheme for Negeh and Jordan Valley, $500,000.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Reports From Abroad (Continued)

Poland, Gdynia — Polish Government plans constructing commercial shipyard and port development, here, to J. Samuel White & Co., Ltd., Cowes and Wspolnota, Interesow.

Scotland—British Oxygen Co., Ltd., **Quoich**, preparing plans constructing factory, power station at Kinlochhawn and reservoirs at Cluanie and Garry, $17,500,000 Separate bids to be called in February***Imperial Chemical Industries, Ltd., **Bellshill**, soon takes bids constructing chemical plant, for which Government subsidy has been obtained, $1,000,000***Corporation Housing Committee, **Aberdeen**, making plans 13 blocks of flats on Southmouth St., $1,500,000. Bids to be called early in February***Scottish Cables Ltd., Paisley Rd., **Glasgow**, constructing factory, to J. Train & Co., Ltd., 30 George Square, Glasgow, $600,000***Scottish Special Area Housing Association, **Lanark**, preparing plans 600 house construction in Carluke area, $1,250,000. Bids late in January.

Wales — North Wales & South Cheshire Electricity Authority, **Cardiff**, drawing up plans for extensions, $560,000***North Wales Electrical Power Co., Ltd., **Llanrung**, preparing plans extensions, $750,000***Ministry of Transport bids in January for reconstructing Menai Bridge at **Anglesey**, $1,160,000 voted ***The Eastern Valley Sewerage Committee, **Ponthir**, voted $1,280,000 for joint sewerage scheme for municipalities of Pontypool, Cwmbian and Blaenavon***Ministry of Transport, constructing by-pass at **Skewan**, by day labor, $3,750,000***Magnesium Co., **Swansea**, making plans new plant at Port Tennant, $1,000,000***Electric Supply Co., Ltd., **Machynlleth**, plans extending plant and purchasing equipment in 1938, $800,000*****Pembroke**, Municipality plans sewerage scheme, $650,000***Great Western Railway, **Llanelly**, making plans constructing overhead bridge to eliminate level crossing and for station improvements, $600,000. Private plans*** Ministry of War preparing plans munition factory at **Landore**, $1,500,000.

PUBLIC BUILDINGS

PROPOSED WORK

Calif., Fresno—State surveys by B. G. McDougall, state archt., P. Wks. Bldg., Sacramento, combined administration and student activities building at Fresno State College, $150,000; men's gymnasium, $250,000.

Calif., Napa—State plans by B. G. McDougall, state archt., P. Wks. Bldg., Sacramento, rein.-con. barracks unit, 200 bed capacity, at Veterans' Hospital. $250,000.

Calif., Niles—Niles School Dist. plans by J. J. Donovan, 930 Parker St., Berkeley, 1 story, steel, rein.-con. auditorium to seat between 450 and 500 persons.

★**Calif., Pasadena** — Huntington Memorial Hospital, Congress St., sketches by Hunt & Chambers, 408 South Spring St., and takes bids about Feb. 1, constructing 5 story, Class A hospital building and remodeling present buildings. $500,000.

Calif., San Jose—San Jose School Dist. plans additions to Technical High, Herbert Hoover and Peter H. Burnett, Jr., High Schools. $300,000 or more. Will be financed by sale of present high school and Washington Square site, to the State of California.

Ill., Argo—Community High School Dist. Dist. 217, F. A. Brodnicki, secy., c/o Argo High School, plans by Burnham & Hammond, 134 North LaSalle St., Chicago, constructing Argo-Summit High School, 3 story, basement, 63rd St. and 74th Ave. $270,000. Election Jan. 8 to vote on project.

Ky., Beattyville — City plans municipal power plant. $90,000 bond issue approved.

★**†Ky., Louisville—Federal** Housing Authority, Wash., D. C., plans constructing housing project, Shelby and Jefferson Sts., $4,000,000.

Ky., Vanceburg—City plans municipal electric light and power plant. $148,000 bond issue approved. Noted Oct. 11, C.D.—Oct. 14, E.N.-R.

★**†La., New Orleans**—Federal Housing Administration, Wash., D. C., and New Orleans Housing Authority, L. K. Williams, pres., plans by A. Owen, Canal Bank Bldg. and H. T. Undrewood, Canal Bank Bldg., for constructing low cost housing project for white people; and by M. H. Goldstein & Associates, American Bank Bldg., for low cost housing project for negroes. $7,200,000. A. M. Fromherz, New Orleans, executive director and consult. engineer.

Maryland — Montgomery Co. Bd. Educ., Rockville, Court House, plans 3 room addition to present school, Poolesville, $45,000; 2 classroom addition to school at Rockville, $30,000; 1 story addition to school, Sherwood, $45,000; 6 classroom, 2 story, basement addition to school, Gaithersburg, $75,000. H. W. Cutler, 1108-16th St. N.W., Wash., D. C., probable architect.

★**Mass., Boston**—E. M. Winer, 15 Arlington St., plans by Strickland & Strickland, 75 State St., 17 story, basement, 77x118 ft., brick, stone, steel apartment, concrete found., Arlington St. $1,500,000. **Maturity in 1938.**

Mass., Hyde Park (sta. Boston)—City of Boston, Dpt. School Building, 26 Norman St., Boston, plans 3 story, basement, school. To exceed $150,000. Architect not appointed.

Mo., Chillicothe—City, final plans in progress and takes bids early in January, constructing power plant addition. $300,000. Henrici-Lowry Eng. Co., 114 West 10th St., Kansas City, Mo., engrs. Noted Dec. 9, C.D.—Dec. 16, E.N.-R.

Mo., Kansas City—Bd. Educ., bids early in January, constructing Delano School, 1 story, brick, rein.-con. $300,000. C. A. Smith, 800 Finance Bldg., Kansas City, Mo., archt. Noted Nov. 15, C.D.—Nov. 18, E.N.-R.

★**†Neb., Lincoln**—Federal Housing Authority, Wash., D. C., plans constructing housing project. $1,500,000. Petition filed with city authorities advocating project. City legal department now studying recent state law passed by the last legislature under which the cities may participate with the House Administration by advancing 10% of cost, the site being included in this part of said costs.

N. J., Somerville—See "Unclassified."

N. J., Succasunna — Bd. Educ. Roxbury Twp., Town Hall, soon takes bids new high school building and alterations to present grade school building. $343,000. Project approved by Govt. P.W.A. project. W. Slifer, 10 Park Pl., Morristown, archt. Noted Aug. 30, C.D. —Sept. 2, E.N.-R.

★**N. M., Marlboro**—State, Dpt. Institute & Agencies, State House, Trenton, plans by H. A. Kelly, State House, Trenton, constructing hospital building for disturbed patients at Tuberculosis Insane Hospital. Total $810,000.

†N. Y., Delmar—Treas. Dpt. at office Sup. Archt., Wash., D. S., soon takes bids constructing U. S. Post Office, Delaware Ave. and Grove St. $75,000. Site selected. Noted Sept. 24, C.D.—Sept. 30, E.N.-R.

★**N. Y., Flushing** — Bd. Educ., 500 Park Ave., New York, soon takes bids constructing 4 story, 202x363 ft. high school, 150th St. and Reeves Ave. $2,500,000. W. C. Martin, Flatbush Ave. extension and Concord St., Brooklyn, archt.

N. Y., Lafayette — Central School Dist. postponed construction of school. To exceed $150,000. Site not selected. **Maturity 1939.** Engineer and architect not appointed. Noted Nov. 29, C.D.—Dec. 2, E.N.-R.

N. Y., New York—Bd. Educ., 500 Park Ave., New York, plans by W. C. Martin, archt. and supt. School Buildings, Flatbush Ave. extension and Concord St., Brooklyn, constructing 3 story school, 113-137 West 138th St. $280,000.

★**N. Y., New York**—Bd. Educ., 500 Park Ave., New York, plans by W. C. Martin, archt. and supt. School Buildings, Flatbush Ave. extension and Concord St., Brooklyn, constructing 4 story, 191x421 ft., brick high school, 172nd St. between Morris and Sheridan Aves. $1,750,000.

★**N. Y., New York** — Dpt. Hospitals, 125 Worth St., plans by McKim, Mead & White, 101 Park Ave., New York, constructing 10 story, hospital administration building at Bellevue Hospital, East 26th St. $3,000,000.

N. Y., New York — Bd. Educ., 500 Park Ave., soon takes bids constructing 3 story, 89x189 ft. school, 160th St., Forest and Tinton Aves. $380,000. W. C. Martin, Flatbush Ave. extension and Concord St., Brooklyn, archt.

★**N. Y., New York**—Bd. Educ., 500 Park Ave., soon takes bids 10 story, 189x200 ft. Needle Trades High School, 225 West 24th St. $2,150,000. W. C. Martin, Flatbush Ave. extension and Concord St., Brooklyn, archt.

★**N. Y., Rego Park**—Bd. Educ., 500 Park Ave., New York, soon takes bids constructing high school, 110th St. and 66th Rd. $1,750,000. W. C. Martin, Flatbush Ave. extension and Concord St., Brooklyn, archt.

†N. Y., Richfield Springs—Treas. Dpt. at office Sup. Archt., Wash., D. C., soon takes bids constructing U. S. Post Office, Main St. $83,000. Noted Sept. 23, C.D.—Sept. 30, E.N.-R.

N. Y., Scarsdale — Village, Village Hall, plans constructing new village hall, on Butler Field. $161,192. **Maturity indefinite.** Taxpayers to vote on bond issue to finance same. H. G. Webb, 101 Park Ave., New York, archt. Noted Aug. 12, C.D.—Aug. 19, E.N.-R.

★**†N. Y., Syracuse**—Federal Housing Authority and City of Syracuse, plans by King & King, Dennison Bldg., constructing apartment type buildings for Housing Project and plans by Randall & Vedder, S. A. & K. Bldg., for group housing. $2,500,000. Noted Dec. 16, C.D.—Dec. 23, E.N.-R.

N. Y., Utica—State Div. Military & Naval Affairs, Capitol Bldg., Albany, plans constructing armory. $300,000. Private plans. State Legislature will consider application for funds at once.

N. Y., Utica—Bd. Supervs. Oneida Co., soon takes bids remodeling heating plant at County Home and Hospital from 1 pipe system to vacuum system, and other improvements. $25,000.

★**†N. Y., Utica**—Federal Housing Project, Wash., D. C., and City of Utica, City Hall, plan constructing Housing Project. $1,000,000. Architect and engineer not appointed. Municipal Housing Authority to be created at once and file application for federal funds.

N. Y., Westfield — Dpt. Correction, State Bldg., Albany, plans additional housing facilities, at Westfield Prison Farm. To exceed $150,000. W. E. Haugaard, State Bldg., Albany, archt. T. F. Farrell, State Bldg., Albany, engr.

Okla., Edmond — City made preliminary plans constructing municipal light and power plant. $75,000. Engineer not appointed.

†Okla., Okewah—Treas. Dpt. at office Sup. Archt., Wash., D. C., plans constructing U. S. Post Office, 5th and Bway. $90,000. Site purchased.

Okla., Seminole — City made preliminary plans constructing municipal light and power plant. $100,000. R. N. Geer, Seminole, engr.

Pa., Bradford — McKean County Housing Authority, A. Johnson, postmaster, 113 Main St., Bradford, plans 75 frame units, incl. probably central heating plant, McKean Co. $300,000.

Pa., Bradford—Bradford Hospital, R. F. Hosford, bus. mgr., Pleasant St., plans 2 story, brick, steel nurses' home, Pleasant St. Architect not appointed.

Pa., Edinboro—Commonwealth of Pennsylvania, A. S. Janeway, executive dir., 609 North 2nd St., plans by R. Irvin, Starr Bldg., Pittsburgh, 1 story power plant, incl. water and steam lines, sewers and emergency lighting system, at State Teachers College. $160,000.

R. I., Johnston — Town, Superintendent of Schools, indefinitely postponed construction brick, steel high school, Atwood Ave. $255,000. O. DiSaia, 509 Westminster St., Providence, archt. Noted Oct. 1, C.D.—Oct. 7, E.N.-R.

★**†S. C., Charleston**—Federal Housing Authority, Wash., D. C., and City of Charleston, B. R. Maybank, mayor, City Hall, plans by D. B. Hyer, Peoples Bldg., 2 story, brick buildings for Housing Project, Grove St. $2,000,000. $900,000 tentatively allotted.

S. D., Huron—City defeated $200,000 bonds constructing municipal auditorium. $363,636. Noted Dec. 6, C.D.—Dec. 9, E.N.-R.

N. S., New Glasgow—Picton County Power Bd. making plans constructing complete steam generating plant. $250,000. D. Dunbar, New Glasgow, engr. Noted Aug. 10, C.D.—Aug. 13, E.N.-R., under "Industrial Buildings."

★**Ont., Ottawa**—Secretary Ottawa Technical School Bd., bids early in January, for additions and improvements to Ottawa Technical School, Albert St. $500,000. Noted Mar. 17, C.D.—Mar. 25, E.N.-R.

★**Que., Montreal** — Municipality making plans 5 story, basement, steel, stone city hall, plain found. $500,000. J. E. Blanchard, City Hall, dir. P. Wks.

BIDS ASKED

†Florida—Jan. 18, by U. S. Eng., Jacksonville, constructing attendants' quarters at Ortana Lock, Caloosahatchee River and Lake Okeechobee Drainage Areas.

Ill., Princeton — Jan. 12, by City, J. E. Everson, supt. Dpt. Light & Water Plant, building changes and equipment foundations for 1,000 kw. steam turbo-generator with alternate on 1,250 kw. unit, surface condenser, complete with circulating pumps and auxiliary equipment, forced draft type cooling tower, a steam boiler 22,550 lb. steam per hr. capacity, stoker, coal and ash handling equipment, feedwater pumps, piping, valves and fittings, changes to switchboard and station wiring. $100,000.

Ill., Shawneetown — See "Contracts Awarded."

★**Ia., Ames** — Jan. 4, by Bd. Educ., constructing school. $500,000. P.W.A. project. Tinsley, McBroom & Higgins, 602 Hubbell Bldg., Des Moines, archts.

†N. H., Concord—Jan. 20 (extended date), by Treas. Dpt. at office Sup. Archt., Wash., D. C., altering and constructing 3 story, basement, brick, stone, granite post office and court house addition, incl. heating, plumbing, electrical work. $130,000. Noted Dec. 17, C.D.—Dec. 23, E.N.-R.

N. H., Nashua—See "Contracts Awarded."

N. H., Tilton—Jan. 5, by C. R. Whitcher, 814 Elm St., Manchester, 3 story, basement, brick, steel, stone school dormitory, concrete found., incl. heating, plumbing and electrical work, for Tilton School, F. Duffy, chn. Building Comn., Franklin. $150,000. Noted July 21, C.D.—July 29, E.N.-R.

N. J., Hamilton — Jan. 5, by Bd. Educ. Hamilton Twp., Town Hall, constructing Yardville Elementary School. $200,000. **P.W.A.** project. H. L. Mack, 2428 Liberty St., archt. Noted Sept. 29, C.D.—Oct. 7, E.N.-R.

N. Y., Brooklyn—See "Contracts Awarded."

N. Y., Buffalo — Jan. 27, by State Dpt. Health, State Bldg., Albany, general contract 5 story hospital addition, for Institute of Study of Malignant Diseases, High St., incl. heating, electrical work, electric elevators, $450,000. T. F. Farrell, State Bldg., Albany, Public Buildings (Continued)

engr. W. E. Haugaard, State Bldg., Albany, archt. Noted Oct. 29, C.D.—Nov. 4, E.N.-R.

★**N. Y., Huntington**—Jan. 4, by Bd. Educ., Union Free School Dist. 3, Suffolk Co., general contract, ventilating, plumbing, electrical work for Junior High School. $585,000. Tooker & Marsh, 101 Park Ave., New York, archts. Noted Aug. 11, C.D.—Aug. 19, E.N.-R.

N. Y., Oxford—Jan. 20 (extended date), by State Dpt. Social Welfare, 112 State St., Albany, constructing cold storage plant, at New York State Women's Relief Corps Home. $46,000. W. E. Haugaard, State Bldg., Albany, archt. T. F. Farrell, State Bldg., Albany, engr. Noted Nov. 18, C.D.—Nov. 25, E.N.-R.

N. Y., Rome — Purchasing Agent, Oneida Co. Court House, taking bids generator diesel engine, power plant equipment, automatic stokers, water tanks, piping, for Bd. Managers Hospital Committee. $25,000. F. T. Kirkland, Rome, engr.

N. Y., Rushville—Central School Dist. taking bids on foundations for school. Total cost $305,400. P.W.A. project. Bley & Lyman, 505 Delaware Ave., Buffalo, archts. Noted Dec. 16, C.D.—Dec. 23, E.N.-R.

★**O., Cleveland**—Jan. 17, by Bd. Educ., E. Weidner, pres., East 71st St., 3 story, basement, 140x240 ft., brick, rein.-con., steel school, East 71st St. and Dressler Court. $500,000. Former contract rescinded. Fox & Duthie, 1936 Union Trust Bldg., archt. Noted Dec. 1, C.D.—Dec. 9, E.N.-R.

O., Cuyahoga Heights — Jan. 17, by Bd. Educ., 4 story, basement, 200x340 ft. all-grade school building, East 71st St. $425,000. Fox & Duthie, Union Trust Bldg., Cleveland, archts.

Okla., Blackwell — City, c/o D. Randall, mayor, bids about Jan. 4 (tentative date), 4000 kw. turbine generator for improving existing power plant. $300,000. Black & Veatch, 4706 Bway., Kansas City, Mo., engrs. Noted Aug. 26, C.D.—Sept. 2, E.N.-R.

Okla., Shawnee—See "Contracts Awarded."

Pa., Hazleton—Jan. 4, by General State Authority, A. S. Janeway, executive dir., 600 North 2nd St., Harrisburg, general contract, heating, ventilating, plumbing, drainage, electrical work, constructing maternity ward, children's ward and clinic building and boiler room and laundry building at Hazleton State Hospital.

★**Pa., Pittsburgh**—Jan. 7 (change of date), by Commonwealth of Pennsylvania, A. S. Janeway, executive dir, 600 North 2nd St., Harrisburg, 18 story, steel psychiatric hospital, 4th ward. $2,847,000. R. Marlier, Empire Bldg., archt. J. Farris, Empire Bldg., engr. Noted Dec. 8, C.D.—Dec. 16, E.N.-R.

Pa., Waymart—Jan. 4, by General State Authority, at office A. S. Janeway, executive dir., 600 South 2nd St., Harrisburg, general contract, heating, ventilating, plumbing, drainage, electrical work, Ward Buildings "W" and "X" and Connecting Corridor D, diagnostic treatment building, garage building and addition to kitchen at Fairview Hospital.

S. D., Aberdeen—Jan. 6, by Bd. Educ., auditorium and gymnasium. $300,000. Noted Sept. 1, C.D.—Sept. 9, E.N.R.

†**Tex., Galveston**—Jan. 14, by U. S. Eng., Galveston, constructing rein.-con. office building on pile foundation, at Fort Point, near there, incl. heating, plumbing, electrical work.

Tex., Kingsville—Jan. 20, by Texas College of Arts & Industries, c/o J. O. Loftin, supt., 2 story, 70x140 ft., brick, rein.-con. science building, concrete pile found. $210,000. Phelps & DeWees, Gunter Bldg., San Antonio, archts. Kenan & L. D. Matthews, Smith-Young Tower Bldg., San Antonio, structural engrs. L. D. Royer, Smith-Young Tower, San Antonio, mechanical engr. Noted Nov. 19, C.D.—Nov. 25, E.N.-R.

Tex., San Antonio—Jan. 11, by State Bd. Control, 60x140 ft., corrugated iron dairy quarters, blacksmith shop and implement shed, South Presa St. $45,000. Some small equipment for blacksmith shop will be purchased. H. T. Phelps, 519 Hicks Bldg., archt.

Tex., San Antonio — See "Contracts Awarded."

W. Va., Charleston—Jan. 5, by City at office M. R. Mathews, city mgr., erecting municipal auditorium. A. F. Wipong, 600 Virginian Land Bank Bldg., archt.

Ont., St. Thomas—Jan. 10, by T. B. McQuesten, in charge Dpt. P. Wks., Toronto, constructing brick, steel, rein.-con. power house, No. 4 Hy. $150,000. Prices wanted on all equipment, steel water tower, cranes, coal and ash handling equipment, incinerators, radial brick chimney. W. L. Somerville, 30 Bloor St., Toronto, archt. Noted July 21, C.D.—July 29, E.N.-R.

LOW BIDDERS

†**Ia., Burlington**—Treas. Dpt. at office Sup. Archt., Wash., D. C., Dec. 14, constructing auditorium, from Peter Kiewit Sons Co., 4521 Dodge St., Omaha, Neb., $403,430. P.W.A. project. Noted Nov. 1, C.D.—Nov. 4, E.N.-R.

★**N. Y., Bay Shore**—Bd. Educ., Union Free School Dist. 1, general contract school, from J. H. Eisele Co., 18 East 41st St., New York, $685,000 *** plumbing, from J. McCullagh, 429 West 44th St., New York, $47,200 ***heating, from Dierks Heating Co., 210 East 31st St., New York, $93,000. Noted Nov. 24, C.D.—Dec. 2, E.N.-R. Noted Nov. 24, C.D.—Dec. 2, E.N.-R.

★**N. Y., Brooklyn**—R. V. Ingersoll, pres. Brooklyn Boro, Dec. 23, general contract constructing Brooklyn Central Library, Eastern Parkway and Grand Army Plaza, from Cauldwell Wingate Co., 101 Park Ave., New York, $1,313,747***plumbing, from J. E. Kahn, 131 East 42nd St., New York, $109,635 *** heating, from Dierks Heating Co., 210 East 31st St., New York, $211,900 *** electrical work, from Rao Electrical Equipment Co., 150 East 41st St., New York, $134,700***elevator, from Otis Elevator Co., 11th Ave. and 26th St., New York, $52,188 or $51,788. Noted Dec. 13, C.D.—Dec. 16, E.N.-R.

★**Pa., Harrisburg**—General State Authority, A. S. Janeway, executive dir., 600 North 2nd St., Dec. 21, general contract state hospital, incl. tuberculosis building, power house, service building, 2 residences and remodeling solarium into medical center, from John McShain, 1610 North St., Phila., $567,200***heating, from Riggs-Distler Co., 1518 Walnut St., Phila., $273,127***plumbing, from Corbit's, 1220 Centre Ave., Reading, $103,300***electrical work, from Benni Electrical Co., Phila., $99,740. Noted Dec. 7, C.D —Dec. 9, E.N.-R.

CONTRACTS AWARDED

Calif., Banning — Banning Union High School Dist., 145x329 ft., 40x146 ft. and 36x196 ft., rein.-con., structural steel high schools, each 1 story, at Banning and Palm Springs, to Pinkerton & Jameson, 118-5th St., Corona, **$266,000. P.W.A.** Bids Dec. 14. Noted Nov. 24, C.D.—Dec. 2, E.N.-R.

Calif., Dinuba — Trustees of Dinuba Joint Union High School Dist., 2 story, rein.-con. high school, to Richmond Constr. Co., P. O. Box 52, Fresno, **$198,700.** Subject to **P.W.A.** approval. Bids Dec. 15. Noted Dec. 7, C.D.—Sept. 2, E.N.-R.

Calif., Fruitridge — Trustees Fruitridge School Dist., 1 story, wood frame and stucco school, incl. 14 classroms, assembly hall, offices, etc., to O. Steinbrenner, 2146 Perkins Way, Sacramento, **$92,611.** Bids Dec. 6.

Calif., Montebello — Montebello Unified School Dist., consrtucting classroom and administration building at Montebello Junior High School, to L. A. Geisler, 6212 Middleton St., Huntington Park, **$138,609.** Bids Dec. 6. Noted Nov. 29, C.D.

Calif., Redding — G. B. McDougall, state archt., P. Wks. Bldg., Sacramento, additions to equipment repairs shops, to J. P. Brennan, Redding, for State, **$18,648.** Bids Nov. 30. Noted Nov. 16, C. D.—Nov. 18, E. N.-R.

†**Calif., Sacramento**—Con. Q.M., Sacramento Air Depot, general contract completing shops and repairing docks at Air Depot, to Eaton & Smith, 715 Ocean Ave., San Francisco, **$306,500*****heating and ventilating, to Cory & Joslin, Inc., 50 Hawthorne St., San Francisco, **$59,783*****electrical work, to Reliable Elevator Wks., 619 California St., Sacramento, **$107,200.** Grand total $473,483. Bids Dec. 7. Noted Oct. 29, C.D.—Nov. 4, E.N.-R.

Calif., Woodlake — Trustees of Woodlake Union High School Dist., wood frame high school, to Trewhitt-Shields & Fisher, Pacific Southwest Bldg., Fresno, **$139,000.** Award subject to **P.W.A.** approval. Est. $150,000. Bids Dec. 16. Noted Dec. 7, C.D.—Sept. 2, E.N.-R.

†**Conn., New London**—Treas. Dpt. at office Sup. Archt., Wash., D. C., repairing and waterproofing buildings at U. S. Coast Guard Academy, to United Constr. Co., 254 West 54th St., New York, N. Y., **$35,400.** Bids Dec. 3. Noted Nov. 30, C.D.

Conn., Stafford Springs—At office of First Selectman, 20 room, brick, steel Senior-Junior High School, to Smith Constr. Co., 101 Water St., Derby, for Town, c/o C. B. Penney, chn. Building Comn., **$136,623.** Bids Dec. 17, awarded Dec. 21. Award subject to **P.W.A.** approval. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

†**D. C., Wash.**—Architect of Capitol, Wash., D. C., pneumatic tube service system in Library of Congress, to Lamson Co., Lamson St., Syracuse, N. Y., **$131,000.**

Idaho, Moscow—Independent School Dist. Class A, 5, Latah Co., excavation for 3 story, steel frame, brick concrete high school incl. 2 pipe steam heating plant with unit ventilators, to F. D. De Atley, Lewiston, **$4,946. P.W.A.** Bids Nov. 19. C. I. Carpenter, 204 Sun Life Bldg., Spokane, Wash., archt. Noted Sept. 15, C. D., Sept. 23, E. N.-R.

Idaho, Twin Falls—Twin Falls School Dist., electrical work for Lincoln School project, to American Electrical Co., Twin Falls, **$4,833. P.W.A.** Bids Nov. 18. Noted Nov. 29, C.D.—Dec. 2, E.N.-R., under "Contracts Awarded."

★**Ill., Chicago**—Bd. Educ., Dist. 219, general contract 3 story, basement high school, to A. Smith & Co., 134 North LaSalle St., **$489,900** *** heating and ventilating, to Commonwealth Heating Co., 5921 North Clark St., **$83,291*****plumbing, to M. J. Carboy Co., 405 North Des Plaines St., **$49,400*****electrical work, to Hoffman Electric Co., 2525 Van Buren St., **$38,180.** Grand total $660,771. **P.W.A.** Bids Dec. 13. Noted Dec. 9, C.D.—Sept. 16, E.N.-R.

†**Ill., Downers Grove**—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S.

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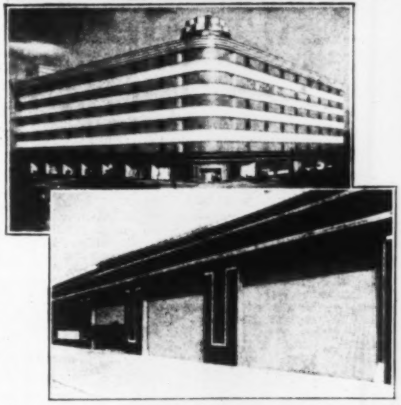

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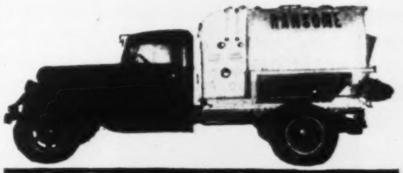

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Public Buildings (Continued)

Post Office, to Biggs, Gregory & Biggs Constr. Co., 7635 South Hermitage Ave., Chicago, **$68,200.** Bids Dec. 10. Noted Nov. 12, C.D.—Nov. 18, E.N.-R.

Ill., Elgin — Bd. Educ., general contract high school addition, to C. B. Johnson & Son, 8 North Michigan Ave., Chicago, **$403,506*****heating, to A. J. Ironside, 612 East Chicago St., **$41,727*****plumbing, to A. W. Murray Co., Hoopeston, **$18,000*****electrical work, to Wadeford Electric Co., 250 West Wacker St., Chicago, **$15,952.** Grand total $497,185. **P.W.A.** Bids Dec. 15. Noted Dec. 8, C.D.

Ill., Harrisburg—Bd. Educ., School Dist. 43 of Saline Co., C. R. Malan, supt., altering and constructing 1 story, basement, 130x175 ft. addition to McKinley School, to Hunt Constr. Co., 17½ South Main St., **$88,487.** Bids Dec. 15. Noted Dec. 9, C.D.

★ **†Ill., Shawneetown**—Gallatin County Housing Authority, C. R. Lord, assistant State W.P.A. Director, in charge, constructing 175 cinder block dwellings, 16 business buildings, 2 school houses, gymnasium for high school, city hall, fire station, community house with auditorium, extending waterworks, all in connection with moving town 3 mi. inland from Ohio River, to 320 acre site by **W.P.A.** labor. **$1,295,000.** Work started. W.P.A. grant of $680,495 and a Disaster Loan Corp. loan of $450,000 to be added to State appropriation of $150,000 and $12,000 allocation from Motor Fuel Tax funds for highway construction.

Ia., Hampton—Bd. Educ., general contract school, to Hogenson Constr. Co., Belmond, **$32,042*****plumbing and heating, to Carsten Bros., Ackley, **$5,849*****electrical work, to Pratt Electric Co., Des Moines, **$1,387.** Grand total $39,278. **P.W.A.** Bids Dec. 3. Noted Nov. 18, C.D.—Nov. 25, E.N.-R.

Kan., Kansas City — J. A. Mermis, bus. mgr., Capitol Bldg., Topeka, improving present power plant of University of Kansas Hospital, to Universal Constr. Co., 505 Hall Bldg., Kansas City, Mo., **$33,333;** equipment, to U. S. Eng. Co., 914 Campbell St., Kansas City, Mo., **$22,000.** Bids Dec. 1, awarded Dec. 11. **P.W.A.** T. Nall, Capitol Bldg., Topeka, archt. Noted Nov. 22, C.D.—Dec. 2, E.N.-R.

Kan., Topeka—Bd. Educ., general contract for Grant School, 2 story, 90x192 ft., brick, stone, rein.-con., to F. M. Spencer & Son, 1806 Harrison St., **$147,445.** Bids Dec. 9. **P.W.A.** Noted Nov. 30, C.D.—Dec. 2, E.N.-R.

†Kan., Wadsworth—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing elevator in Building 19, to Kimball Bros., Council Bluffs, **$2,670.** Bids Dec. 14. Noted Nov. 17, C.D.—Nov. 25, E.N.-R.

Kan., Wamego—Bd. Educ., general contract constructing high school, to M. J. Green, 113 North 3rd St., Manhattan, **$156,375.** Bids Dec. 10. Noted Dec. 1, C.D.

La., Lake Providence and Monticello—East Carroll Parish School Bd., Lake Providence, to M. T. Reed Constr. Co., Belzoni, Miss., a 1 story brick negro school building **$35,383;** 2 story brick high school building **$140,993,** both Lake Providence; 1 story frame building at Monticello **$28,102.** Grand total $204,478. H. H. Land, Monroe, archt. Noted Nov. 26, C.D.—Dec. 2, E.N.-R.

†Mass., Rockport—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Di Sandro Bros., 106 Langdon St., Providence, R. I., **$52,100.** Bids Dec. 3. Noted Nov. 5, C.D.—Nov. 11, E.N.-R.

†Mich., Dearborn — Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing Boiler House 10, and Garage Building 12, to Cooper Little Co., 572 Maccabee Bldg., Detroit, **$170,700.** Bids Dec. 14. Noted Nov. 3, C.D.—Nov. 11, E.N.-R.

Mich., Detroit—Public Lighting Comn., East Atwater Sts., furnishing, installing 2 induction regulators and the necessary switching and wiring equipment at McCurdy and Luden substations, to Hartzel & Buehler, 618 Murphy Bldg., **$49,643. P.W.A.**

Minn., Red Wing—Bd. Educ., constructing 2 story, basement, rein.-con., brick, tile school, to M. E. Greenberg Co., 630 Security Bldg., Minneapolis, **$61,750. P.W.A.** Bids Dec. 2. Noted Oct. 27, C.D.—Nov. 4, E.N.-R.

Miss., Pascagoula — Bd. Supervs. Jackson Co., 1 story, 120x282 ft. addition to original plant 120x505 ft., now under construction, between Pascagoula and Moss Point, incl. sprinkler system, to B. L. Knost Constr. Co., Pass Christian, **$55,668.** Est. $50,000. Bids Dec. 6, awarded Dec. 11. Noted Nov. 22, C.D.—Dec. 2, E.N.-R.

Miss., University—State Bd. Trustees, House of Representatives, Jackson, constructing university school, to W. J. McGee & Son, 419 Mississippi St., Jackson, **$261,725.** R. W. Naef, Millsaps Bldg., Jackson, archt. Bids Dec. 10. Noted Nov. 19, C.D.—Nov. 25, E.N.-R.

†Mo., St. Louis—Treas. Dpt. at office Sup. Archt., Wash., D. C., carving U. S. Post Office, to E. Ardiline, 286 5th Ave., New York, **$25,290.** Bids Dec. 8.

Neb., Hastings—State Bd. Control, Lincoln, lines, water pipe and return lines, electric conduits for ward buildings at Hastings State Hospital, to Stewart Plumbing Co., Hastings, **$12,647;** 920 ft. tunnel, to W. A. Biba Eng. Co., Geneva, **$15,650.** Total est. $363,600. Bids Dec. 7. Noted Oct. 22, C.D.—Oct. 28, E.N.-R.

N. H., Durham—University of New Hampshire, electrical work for laboratory and service building, to R. Farmer, 63 Amherst St., Manchester. Noted Nov. 9, C.D.—Nov. 18, E.N.-R., under "Contracts Awarded."

N. H., Nashua—City, Mayor A. A. Lucier, City Hall, 3 story, basement, brick, steel, stone, granite city hall, concrete found., force account. **W.P.A.** To exceed **$150,000.** Noted Mar. 12, C.D.—Mar. 18, E.N.-R.

N. J., Howell—Bd. Educ., Town Hall, water well for grade school, to C. W. Lauman & Co., 50 Church St., New York, **$3,195;** excavating and grading, to F. Sidlinger, Hazlet, **$1,045. P.W.A.** Noted Aug. 30, C.D.—Sept. 2, E.N.-R.

N. Y., Brooklyn — Bd. Higher Education, Academic Bldg., Brooklyn College, Bedford Ave., drainage at Brooklyn College, to I. Hyman, **$5,755*****iron fence, to Cyclone Fence Co., 796 Frelinghuysen Ave., Newark, N. J., **$21,500*****electrical work, to Hatzel & Buehler, Bedford Ave. and Avenue H, **$12,492.** Grand total $39,647. Bids Oct. 4. Noted Sept. 23, C.D.—Sept. 30, E.N.-R.

†N. Y., Buffalo—Griffon Constr. Co., general contractors, 11 West 42nd St., New York, erecting structural steel for U. S. Post Office, Ellicott St., for Treas. Dpt. at office Sup. Archt., Wash., D. C., to Kenmore Contg. Co., 689 Colvin Blvd., Kenmore; masonry contract, to J. Madonia, 874 Smith St., Rochester. Noted Nov. 26, C.D.—Dec. 2, E.N.-R., under "Contracts Awarded."

N. Y., Caledonia — Swarthout & Rowley, general contractors, 548 Mount Hope Ave., Rochester, structural steel for school for District School Bd., to F. K. Heughes & Co., 1029 Lyell Ave., Rochester; steel joists and reinforcing steel, to Concrete Steel Co., 207 James St., Syracuse. **P.W.A.** Noted Dec. 9, C.D.—Dec. 16, E.N.-R., under "Contracts Awarded."

N. Y., Chili—F. Gleason Co., general contractors, 108 Colvin St., Rochester, structural steel for school for School Dist. 9, to F. L. Heughes & Co., 1029 Lyelle Ave., Rochester. Noted Dec. 2, C.D.—Dec. 9, E.N.-R., under "Contracts Awarded."

N. Y., Dundee — Central School Dist. 1, heating for school, to Bareham & McFarland, 136 North St., Rochester, **$54,475*****plumbing, to Warnock & Zahrndt, 742 Clinton Ave., Rochester, **$21,800*****electrical work, to Acme Elctric Co., 148 Glen St., Glen Falls, **$29,400.** Grand total $105,675. **P.W.A.** Bids Dec. 10. Noted Dec. 16, C.D.—Dec. 23, E.N.-R., under "Contracts Awarded."

N. Y., Elba—C. H. Wing Co., Inc., general contractors, structural steel for school, for Central School Dist., to Ernst Iron Wks., 75 Lathrop St., Buffalo. **P.W.A.** Noted Dec. 15, C.D.—Dec. 23, E.N.-R., under "Contracts Awarded."

N. Y., Endwell—Union Free School Dist., heating and plumbing for school, to S. J. Evans, 1713 Riverview Ave., Endicott, **$28,559** and **$15,300** respectively***electrical work, to E. A. Davis, 64 Conklin Ave., Binghamton, **$9,527.** Grand total $53,386. **P.W.A.** Bids Dec. 8. Noted Dec. 21, C.D.—Dec. 30, E.N.-R., under "Contracts Awarded."

N. Y., Endwell—J. Y. Kane, general contractor, 25 Parsons St., Binghamton, concrete masonry work and foundations for school for Union Free School Dist., to T. Stento, 166 Conklin Ave., Binghamton. Noted Dec. 15, C.D.—Dec. 23, E.N.-R., under "Contracts Awarded."

N. Y., Lackawanna—C. H. Everitt, Inc., general contractors, 295 Auburn Ave., Buffalo, structural steel for school, Ridge Rd., for Bd. Educ., Lackawanna, to Buffalo Structural Steel Corp., 166 Dart St., Buffalo. **P.W.A.** Noted Dec. 6, C.D.—Dec. 8, E.N.-R., under "Contracts Awarded."

N. Y., Scio—Central School Dist. 1, foundations, grading for school, to J. Dall Junior, Inc., Seneca Bldg., Ithaca, **P.W.A.** Bids Dec. 9. Noted Dec. 2, C.D.—Oct. 14, E.N.-R.

N. Y., Syracuse—Bd. Contr. & Supply, City Hall, elevator for Charles Andrews High School, to Houser Elevator Co., 315 East Genesee St. Bids Oct. 25. Noted Oct. 13, C.D.—Oct. 21, E.N.-R.

N. Y., Union—C. J. McNerney, general contractor, 69 Kneeland Ave., Binghamton, steel for garage, Main St., for Town of Union, to Gray Steel Co., Ainsley Dr., Syracuse. Noted Nov. 17, C.D.—Nov. 25, E.N.-R., under "Contracts Awarded."

N. Y., Youngstown—J. P. Snyder Constr. Co., Inc., general contractors, 229 Lovering Ave., structural steel for bachelor officers' quarters, for Con. Q.M., to Buffalo Structural Steel Corp., 166 Dart St., Buffalo. Noted Dec. 8, C.D.—Dec. 16, E.N.-R., under "Contracts Awarded."

N. C., Concord—Cabarrus Co. Bd. Educ., constructing 2 schools at Mt. Pleasant and high school addition, to Barger Bros., Mooresville, **$20,999** and **$11,580** respectively***plumbing, to Standard Plumbing & Heating Co., Albemarle, **$4,352.** Grand total $39,768. **P.W.A.** M. R. Marsh, Builders Bldg., Charlotte, archt. Noted Mar. 26, C.D.—Apr. 1, E.N.-R.

N. C., Gastonia — North Carolina Orthopaedic Hospital, constructing isolation and admittance building, etc., to R. H. Pinnix, Gastonia, **$48,653*****heating, to Piedmont Plumbing & Heating Co., Gastonia, **$3,442*****electrical work, to Mill & Marine Electric Co., Gastonia, **$1,432*****improvements to sewerage treatment plant, to J. M. Porter, 526 Louise Ave., Charlotte, **$10,850.** Grand total $64,377. **P.W.A.** Bids Dec. 2 and 3. Noted Nov. 24, C.D.

N. C., Kenansville—Duplin Co. Bd. Educ., to W. L. Jewell, Sanford, constructing Chinquapin School **$4,775;** B. F. Grady School **$5,100;** Calypso School **$8,455*****to W. A. Simon, Inc., 309½ Marstellar St., Wilmington, Beaulaville School **$22,366;** Magnolia School **$13,750*****to Electrical Maintenance Co., 224 North Water St., Wilmington, electrical work on 5 schools, $1,000. Grand total $59,346. Bids Nov. 30. **P.W.A.** Noted Nov. 24, C.D.

†O., Ada—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, to Structural Eng. Corp., 110 East 42nd St., New York, N. Y., **$42,607.** Bids Nov. 2. Noted Oct. 5, C.D.—Oct. 7, E.N.-R.

Okla., Shawnee — Bd. Educ., constructing Franklin Ward School, **W.P.A.** labor, **$160,000.** $31,000 allotted for materials. A. J. Davis, Shawnee, city engr. Noted Oct. 25, C.D.—Oct. 28, E.N.-R.

Okla., Tishomingo—Johnson Co., constructing court house, **W.P.A.** labor, $160,000. Bramblet & Tonini, Cotton-Grain Exch. Bldg., Oklahoma City, archts. Election Jan. 11 to vote $45,000 bonds for materials. Noted Oct. 11, C.D.—Oct. 14, E.N.-R.

Tenn., Maryville—State, constructing school, to V. L. Nicholson Co., 611 South Central St., Knoxville, **$124,900. P.W.A.** Barber & McMurry, 517½ West Church St., Knoxville, archt. Bids Nov. 30.

Tenn., Springfield — State, constructing school, to F. C. Gorrell & Sons, Russellville, **$216,777. P.W.A.** Bids Nov. 30. Noted Nov. 18, C.D.—Nov. 25, E.N.-R.

†Tex., Amarillo—Treas. Dpt. at office Sup. Archt., Wash., D. C., constructing U. S. Post Office, etc., to A. Blair, 1st Natl. Bank Bldg., Montgomery, Ala., **$369,400.** Bids Dec. 7. Noted Nov. 6, C.D.—Nov. 11, E.N.-R.

Tex., San Antonio—City, c/o C. K. Quin, mayor, City Hall, 2 story, basement, 60x140 ft., white stone, rein.-con. steel fire station and repair shops, plain found., by City (relief) labor. Owner takes bids Jan. 1, on all mechanical work and either tile or metal roof. Total est. **$152,000.** L. D. Royer, Smith-Young Tower, mechanical engr. J. W. Beretta Engineers, Inc., Natl. Bank of Commerce Bldg., structural engrs. Noted Nov. 16, C.D.—Nov. 18, E.N.-R.

Tex., Stephenville—Bd. Directors A and M College, College Station, general contract, not incl. any mechanical equipment, etc., 3 story, 52x121 ft., brick, rein.-con. science building, to A. Farnell Blair, 1st National Bank Bldg., Montgomery, Ala., **$58,946.** Bids Nov. 19. Noted Oct. 21, C.D.—Oct. 28, E.N.-R.

Wash., Fort Steilacoom — State, Olympia, constructing women's receiving ward at state hospital, to Allen & Earley, 113½ A St., Tacoma, **$249,000.** Bids Dec. 16, awarded Dec. 16. Noted Nov. 26, C.D.—Dec. 2, E.N.-R.

Wis., Cobb—Union Free High School Dist., general contract high and grade school, to Swan Building Co., Madison, **$55,348*****heating, to American Fdry. & Furnace Co., 709 Milwaukee St., **$9,987*****plumbing and electrical work, to D. W. Hickock, Lancaster, $7,967. Grand total $73,302. Bids Nov. 29. Noted Nov. 16, C.D.—Nov. 18, E.N.-R.

Wis., Pittsville—Joint School Dist. 1, general contract high and grade school, 2 story, 70x107 ft., to Thomsen-Abbott Constr. Co., Marshfield, **$38,964*****electrical work, to A. H. Meyer Co., Oshkosh, **$1,852*****heating, to National Heating Co., Wausau, **$4,989*****plumbing, to Carroll Boyce Co., Wautoma, **$3,030.** Grand total $48,835. Bids Dec. 11. Noted Dec. 2, C.D.

Wis., Waupaca—Bd. Educ., general contract 2 story, 96x112 ft. school, to Hoffman Constr. Co., Appleton, **$63,092*****heating, to Stoehr & Landon, Inc., 1705 West Clyborn St., **$8,707*****plumbing, to Columbus Plumbing & Heating Co., Columbus, **$6,000*****electrical work, to Kretsch Bros. Co., Kiel, **$2,990*****seating, to Eau Claire Book & Seat Co., Eau Claire, **$5,069.** Grand total $85,858. **P.W.A.** Bids Dec. 16. Noted Dec. 9, C.D.

COMMERCIAL BUILDINGS

PROPOSED WORK

★ **Calif., Los Angeles** — Santa Fe Railway Co., Kerchoff Bldg., soon lets contract hospital addition, containing executive offices, internes' quarters, clinics, operating rooms, additional wards, etc., 610 South St. Louis St. $500,000. Private plans.

★ **Ia., Des Moines**—Iowa Methodist Hospital, 1200 Pleasant St., plans 9 story hospital wing, 120 ft. long, and equipment. $500,000. R. O. Wagner, Ankeny, pres. Bd. Directors.

★ **La., New Orleans**—F. W. Woolworth & Co., Woolworth Bldg., New York, purchasing lot and building on Canal and Rampart Sts., and plans demolishing old structure and construct new store building. $500,000. Private plans.

Commercial Buildings (Continued)

Mass., Cambridge—Stone & Webster Eng. Corp., engrs., 49 Federal St., Boston, soon let contract for School of Architecture, Mass. Ave., for Massachusetts Institute of Technology; bids about Jan. 18 for heating and ventilating. Coolidge & Carlson, 89 State St., Boston, archts. Noted Nov. 26, C.D.—Dec. 2, E.N.-R.

N. Y., Buffalo—Neisner Bros., Inc., 49 East Ave., bids in March, 2 story, basement, 85x280 ft., brick, steel department store, plain found., Main St. $300,000. Private plans. Noted Dec. 10, C.D.—Dec. 16, E.N.-R.

N. Y., Flushing—Little Old New York, c/o New York World's Fair, 1939, Inc., Empire State Bldg., 350 5th Ave., New York, plans constructing replica of New York of a century ago, at New York World's Fair Site, Flushing Meadow Park. To exceed $150,000.

N. Y., Flushing—Modern Village, c/o New York State World's Fair, 1939, Inc., Empire State Bldg., 350 5th Ave., New York, plans modern village, World's Fair Site Amusement Zone, Flushing Meadow Park. $150,000 or more.

N. Y., Lockport—Montgomery Ward & Co., 619 West Chicago Ave., Chicago, Ill., soon lets general contract 3 story addition to department store, 130-134 Main St. R. R. Rowe, 619 West Chicago Ave., Chicago, archt. Noted Oct. 20, C.D.—Oct. 28, E.N.-R.

★**N. Y., Loudonville**—Order of Friars Minor, 135 East 31st St., New York, bids about middle of January, constructing college buildings. $500,000. Gander, Gander & Gander, 17 Steuben St., Albany, archts. Noted Nov. 24, C.D.—Dec. 2, E.N.-R.

★**N. Y., New York**—Billiard & Co., Inc., J. A. Billiard, pres., 60 East 42nd St., plans by Sugarman & Berger, 17 East 49th St., constructing two 6 story, 98x185 ft., brick apartments, 254th St. and Arlington Ave. $500,000.

N. Y., New York—Bands Stillman, Inc., 1005 Walton Ave., plans by A. Goldhammer, 40 East 49th St., 6 story apartment, Melrose Ave. and 153rd St. $200,000.

N. Y., New York—Bio Associates, Inc., A. Spires, pres., c/o J. and E. Leitner, Inc., 364 East 149th St., plans 6 story apartment, Morris Ave. and 183rd St. To exceed $200,000.

N. Y., New York—Crescendo Realty Corp., A. A. Campagna, pres., 745 5th Ave., New York, plans by G. F. Pelham, Jr., 100 East 42nd St., constructing 6 story, brick apartment, 236th St., Johnson and Oxford Aves. $275,000.

N. Y., New York—R. Fish, c/o H. H. Lilien, archt., 215 East 149th St., plans 6 story apartment, Creston Ave. and 179th St. To exceed $350,000.

N. Y., New York—Society for Advancement of Judaism, 1440 Bway., plans by A. Goldhammer, 40 East 49th St., altering heating, plumbing in apartment, 13 West 85th St. $40,000.

★**N. Y., New York**—Two Sutton Place South, Inc., c/o P. Uris, 2 Lafayette St., plans by E. Roth & Sons, 18 East 48th St., 18 story apartment, 2-12 Sutton Pl. South. $1,000,000.

★**N. Y., New York**—Barnard College, Bway. and 116th St., plans constructing academic building, Bway. and 116th St. To exceed $1,500,000. Campaign to raise funds.

N. Y., New York—Amherst Club of New York, W. H. Griffin, pres., Lexington Ave. and 36th St., revised plans by McKim, Mead & White, 101 Park Ave., constructing 14 story club, Lexington Ave. and 36th St. $275,000. **Maturity after Feb. 1.**

★**N. Y., Syracuse**—Owner, c/o Ketcham Realty Co., Jefferson Bldg., plans by H. D. Phoenix, Seitz Bldg., constructing 10 story, apartment, 2035 East Genesee St. $500,000. Applied for change in city zoning law to permit construction of same. Noted Dec. 1, C.D.—Dec. 9, E.N.-R.

O., Cincinnati—M. Bruce, 8466 Vine St., plans tract development and dwellings on 150 acre site. To exceed $150,000.

O., Cleveland—A. Carlin, 2717 East 75th St., plans by Walker & Weeks, 2341 Carnegie Ave., and T. W. Lamb, assoc. archt., 701 7th Ave., New York, 1 story basement, 22x100 ft. and 35x100 ft., brick, steel commercial building and theatre, East 14th St. and Huron Rd. $150,000. Trans Lux Corp., subsidiary R.K.O. Pictures, Inc., lessee.

Pa., Cambridge Springs—All H. Ludorf, archt., 410 Asylum St., Hartford, Conn., rejected bids Nov. 18, 2 story, brick, steel administration and dormitory building, for Alliance College, M. B. Steczynsyski, gen. mgr. Noted Nov. 15, C.D.—Nov. 18, E.N.-R.

Pa., Mt. Lebanon—V. A. Rigamount, 5471 Coral St., Pittsburgh, soon lets contract 2 story, basement, 65x117 ft., brick, steel, structural glass theatre, porcelain enamel, modernistic type, Washington Rd., to Harris Amusement Co., Clark Bldg., Pittsburgh. $150,000. Noted Sept. 29, C.D.—Oct. 7, E.N.-R.

Pa., Pittsburgh—Ingham & Boyd, archts., Empire Bldg., soon lets contract 2 story, 102x122 ft., brick, terra cotta, limestone trim religious school, 7th Ward, for Rodef Shalem Congregation, 4905-5th Ave. Noted Oct. 15, C.D.—Oct. 21, E.N.-R.

★**Pa., Valley Forge**—University of Pennsylvania, 34th and Woodland Sts., Phila., plans new freshman college. To exceed $500,000. Architect and engineer, c/o owner, archt. and engr.

★**Que., Montreal**—France Film Co., Ltd., Beaver Hall Hill, making plans constructing 3 brick, steel theatres, plain founds. $700,000. Private plans.

BIDS ASKED

Calif., San Francisco — See "Contracts Awarded."

Md., Baltimore—Dec. 30, by Morgan College (Colored), Hillen Rd., 2 story, basement, 60x100 ft., stone walled library, concrete found., Hillen Rd. $226,000. P.W.A. project. Taylor & Fisher, 1012 North Calvert St., archts.

N. Y., Bellerose—See "Contracts Awarded."

N. Y., Brooklyn—See "Contracts Awarded."

N. Y., Elmhurst—See "Contracts Awarded."

N. Y., Jackson Heights—See "Contracts Awarded."

N. Y., Long Island City—See "Contracts Awarded."

N. Y., Ozone Park — See "Contracts Awarded."

N. Y., St. Albans—See "Contracts Awarded."

N. Y., Woodside—See "Contracts Awarded."

Ont., Windsor—J. E. Pennington, archt., Bank of Commerce Bldg., taking bids constructing sanatorium, Prince Rd., for Essex Co. Health Assn., 1435 Prince Rd.

CONTRACTS AWARDED

Calif., San Francisco—I. Epp & Sons, 4745 Geary St., two Class "A" steel, concrete apartments, Broadway and Octavia Sts., day labor. **$300,000** or more. H. C. Baumann, 251 Kearny St., archt.

Conn., Greenwich — Greenwich Residences Inc., 26 Court St., Brooklyn, N. Y., elevator for 6 story, 110x115 ft., brick, steel apartment, West Elm St., to Watson Elevator Co., 407 West 36th St., New York***plumbing, to Tulley Plumbing & Heating Co., Inc., 4464 Broadway, New York***heating, to Raisler Heating Co., 129 Amsterdam Ave., New York ***roofing, to Long Life Roofing Co., 1925 Flatbush Ave., Brooklyn. Noted Nov. 5, C.D.—Nov. 11, E.N.-R., under "Contracts Awarded."

Ga., Atlanta—Federal Reserve Bank, 104 Marietta St., alterations and reconditioning present air conditioning in Federal Reserve Bank, to Barge-Thompson, 136 Ellis St. N.E. Awarded Dec. 16. Noted Oct. 21, C.D.—Oct. 28, E.N.-R.

★**Ill., Chicago**—Five Thousand Forty Corp., A. J. Fitzgerald, pres., 109 North Dearborn St., tuck pointing for completing 7 story, basement apartment, to C. Paschen Co., 33 North LaSalle St. Est. **$325,000.** Total cost $725,000. Construction stopped in 1929-30 and now to be finished. F. A. McNalley & Associates, 105 West Madison St., archt.

Ill., Highland Park—for F. M. Mandel, 222 East Chestnut St., Chicago, D. S. Klafter, archt., 100 North LaSalle St., Chicago, 3 and 4 story, basement, 60x175 ft. residences, to J. T. Carp, 1791 West Howard St. Est. **$200,000** or more. Noted Oct. 29, C.D.—Nov. 4, E.N.-R.

Md., Bethesda—Woodlawn Development Co., Wash., D. C., or c/o J. Eberson, archt., 1650 Bway., New York, theatre, to D. L. Stern, 1412 I St. N.W., Wash., D. C. Est. exceeds **$150,000.** Noted Nov. 22, C.D.—Nov. 25, E.N.-R.

Md., Baltimore—Agent for S. S. Kresge Co., Lexington St., at Baltimore, 3 story, basement, 50x140 ft., ornamental terra cotta exterior store, Park Ave. at Lexington St., to Consolidated Eng. Co., 20 East Franklin St., for S. S. Kresge Co., 2727-2nd St., Detroit, Mich. Est. **$200,000.** Bids Dec. 14. Noted Dec. 8, C.D.—Dec. 16, E.N.-R.

Mass., Cambridge—Stone & Webster Eng. Corp., conslt. engrs. and general contractors, 49 Federal St., Boston, elevator for School of Architecture, Mass. Ave., for Massachusetts Institute of Technology, to Westinghouse Electric Elevator Co., 164 Stuart St., Boston. Noted Nov. 26, C.D.—Dec. 2, E.N.-R.

★**N. J., Newark** — C. F. MacEvoy, 405 Seventh Ave., 10 story, basement, 232x400 ft. apartment house for 285 families, containing 800 rooms, etc., Roseville and 7th Aves., to C. F. MacEvoy, 138 Roseville Ave., **$1,500,000** plus. Noted Dec. 13, C.D.—Dec. 16, E.N.-R.

★**N. Y., Albertson Station**—LaSalle Homes, Inc., constructing 150 residences, on 450 lot site, own forces. To exceed **$500,000.** A. J. Henderson, in charge. Noted Dec. 17, C.D.—Dec. 23, E.N.-R.

N. Y., Bellerose—Benreiz Investing Corp., 83-50 255th St., constructing group frame dwellings, 225th St. and 82nd Rd., day labor. **$250,000.** Owner will purchase materials. M. A. Cantor, 373 Fulton St., Brooklyn, archt.

N. Y., Brooklyn—Revere Homes, Inc., 940 East 9th St., constructing group dwellings, 2413 East 18th St. and vicinity, day labor. **$150,000.** Owner will purchase materials. Kallich & Weinstein, 184 Joralemon St., archts.

N. Y., Brooklyn—K. Match, 2027 East 37th St., constructing group dwellings, 4363 Bedford Ave., day labor. **$150,000.** Owner will purchase materials. I. Kallich, 174 Joralemon Ave., archt.

N. Y., Brooklyn—Evans Homes, Inc., 369 Flatbush Ave., constructing group brick dwellings, 2326 Olean St., day labor. **$150,000.** W. A. Lacerenza, 391 Fulton St., archt.

N. Y., Elmhurst—Sylved Homes, Inc., 2666 Valentine Ave., New York, constructing group 2 story dwellings, Dongan Ave. and Queens Blvd., day labor. **$150,000.** Owner will purchase materials. D. J. Levinson, 161-02 84th Dr., Jamaica, archt.

★**N. Y., Jackson Heights** — Garden Bay Manor, Inc., c/o N. K. Winston, 22 West 8th St., New York, constructing group one hundred five 2 story, brick dwellings, Ditmars Blvd., 21st Ave., 78th, 76th and 77th Sts., day labor. **$840,000.** Owner will purchase materials. Swartburg & Bennett, 2 West 46th St., New York, archts.

N. Y., Long Island City — Chesterfield Homes, Inc., 37-53 72nd St., constructing group dwellings, 46th St. and 34th Ave., day labor. To exceed **$150,000.** Owner will purchase materials. Wuest & Bailey, 32-02 30th Ave., archts.

N. Y., Long Island City—Grade Realty Corp., 31-13 30th Ave., group 2 story, brick dwellings, 37th Ave. and Crescent St., day labor. Owner will purchase materials. Wuest & Bailey, 32-02 30th Ave., New York, archts.

N. Y., Niagara Falls—F. W. O'Connell, general contractor, 329 Water St., Binghamton, constructing plumbing for store, Main St., for F. W. Woolworth Co., 75 State St., Albany, to Edwards Plumbing & Heating Co., 1140 Ontario Ave; structural steel, to Bethlehem Steel Contg. Co., Bethlehem, Pa. Noted Nov. 30, C.D.—Dec. 2, E.N.-R., under "Contracts Awarded."

N. Y., Ozone Park—Benreiz Investing Corp., 83-50 255th St., constructing group frame dwellings, 122nd St. and 149th Ave., day labor. **$150,000.** Owner will purchase materials. M. A. Cantor, 373 Fulton St., archt.

★**N. Y., Port Chester** — Corporation, c/o J. W. Fries, Grace Church, constructing 168 additional houses on King St., in Alden Estate. To exceed **$500,000.** Owner builds. **Maturity at once.** Private plans.

N. Y., St. Albans—Albans Cambria Homes, Inc., 163-18 Jamaica Ave., constructing group dwellings, 119th Ave. and 222nd St., day labor. **$150,000.** Private plans. Owner will purchase materials.

N. Y., St. Albans—Maskrin Building Corp., 116-51 225th St., constructing group dwellings, 115th Rd., day labor. **$150,000.** Owner will purchase materials. A. F. Meissner, c/o owner, archt.

N. Y., St. Albans—Preferred Homes, Inc., 441 East 53rd St., Brooklyn, constructing group dwellings, 114th Rd. and 222nd St., day labor. **$150,000.** M. Pearlstein, c/o owner, archt. Owner will purchase materials.

★**N. Y., Woodside** — Garden Bay Manor, Inc., 22 West 48th St., c/o N. K. Winston, New York, constructing group dwellings, 78th St., 21st Ave. and 19th Rd., day labor. **$1,000,000.** Owner will purchase materials. Swartburg & Bennet, 2 West 46th St., New York, archts.

O., Hartwell—Cincinnati and Suburban Bell Telephone Co., 225 East 4th St., 2 story, basement, 55x72 ft. new telephone exchange building, Hartwell Ave., to Guenther-Reinhard Co., 816 Central Parkway, Cincinnati, **$150,000.** Hake & Hake, 2400 Gilbert Ave., archts.

O., Zanesville—Good Samaritan Hospital, general contract 2 story, 107x137 ft. laundry and boiler room, to Dunzweiler Constr. Co., Zanesville***plumbing, to J. A. LeRoy, Zanesville***heating, to Bohn & Kern, Zanesville. Bids Dec. 10. Noted Dec. 6, C.D.—Dec. 9, E.N.-R.

Pa., Pittsburgh—Stone & Webster, general contractors, 507 Union Trust Bldg., 1,000 tons structural steel for hospital, for University Hospitals Group, to Bethlehem Steel Co., Bethlehem. Noted Nov. 3, C.D.—Nov. 11, E.N.-R., under "Contracts Awarded."

INDUSTRIAL BUILDINGS

PROPOSED WORK

Calif., Alturas—POWER PLANT—Directors Surprise Valley Electrification Corp., M. E. Prescott, secy., soon let contract brick, concrete power plant, incl. machinery supports, foundations, etc., for equipment. Equipment and equipment installation not included. A. Sickler, Box 161, engr.

Calif., Berkeley — PLANT — Air Reduction Sales Co., 60 East 42nd St., New York, soon lets contract plant, 2nd St.

Conn., Hartford — FACTORY — Allen Mfg. Co., 135 Sheldon St., will not construct 2

Industrial Buildings (Continued)

story, 60x85 ft., brick, steel factory, Sheldon St. $40,000. Project abandoned. Mylchreest & Reynolds, 238 Palm St., archt. Noted July 15, C.D.—July 22, E.N.-R.

★**La., Baton Rouge**—LUBRICATING PLANT—Standard Oil Co. of Louisiana, Louisiana Natl. Bank Bldg., have slowed plans and will not have plans in contracts status before late February or March. Most all improvement will be in vicinity of Baton Rouge and Shreveport. Program of expansion decided upon, consisting largely pipe lines, tankage, refinery and other plant units. $2,800,000 Noted Mar. 4, C.D.—Mar. 11, E.N.-R.

Mass., Haverhill—WAREHOUSE, etc.—Enterprise Department Stores, 1479 Hancock St., Quincy, bids in January, brick, stone warehouse and store, Merrimack St. To exceed $40,000. Morse, Dickinson & Goodwin, 25 Washington St., archts. Noted Dec. 6, C.D.—Dec. 9, E.N.-R.

Mich., Adrian—LIGHT PLANT DIESEL ENGINES, etc.—See "Contracts Awarded."

Mich., Mt. Clemens — BREWERY — Health City Brewing Co., Inc., Mt. Clemens, soon lets separate contracts, improving brewery, incl. bottling plant (alterations to former Mt. Clemens Brewery). $85,000.

Mo., St. Louis—ASSEMBLY PLANT—Ford Motor Co., c/o H. B. Hansen, supt. Power & Constr., Miller Rd., Dearborn, Mich., plans by A. Kahn, archt. and engr., 345 Centre Bldg., Detroit, Mich., 2 story, 675x1600 ft. automobile assembly plant, near junction of Meramec and Mississippi Rivers in Southeastern section of St. Louis Co. Site purchased. Noted Dec. 20, C.D.—Dec. 23, E.N.-R.

N. Y., Brooklyn — WAREHOUSE — Bush Terminal Co., 100 Bway., plans by W. Higginson & Son, 101 Park Ave., New York, altering warehouse for liquor storage, 4901 1st Ave. $75,000.

N. Y., Brooklyn—GARAGE—Mill Basin Asphalt Corp., 5414 Avenue U, plans by Cafiero & Laurusza, c/o owner, 1 story, 100x100 ft. brick garage, 5414 Avenue U.

N. Y., Brooklyn—FACTORY—Macata Corp., 1185 Flushing Ave., plans by Kolb & Miller, 31 Union Square, New York, 3 story factory, 1185 Flushing Ave. $50,000.

N. Y., Corning — LABORATORY — Corning Glass Wks., Corning, bids in January, constructing 4 story, basement, 90x125 ft., brick, steel, glass block laboratory, plain found. To exceed $150,000. Private plans.

N. Y., Long Island City—FACTORY—Welsh Bros. Realty Co., 33 Purvis St., plans by J. M. Baker, 10-06 Jackson Ave., 1 story, 100x100 ft. factory, 31st Pl. and 48th Ave.

N. Y., Long Island City—SHOP, etc.—John Simmons Co., 47-09 39th St., plans constructing shop and storage, 31st Pl., 48th St. and Hunterpoint Ave. $40,000 with equipment. Site acquired.

N. J., Lyndhurst—FACTORY—S. B. Penick Co., 132 Nassau St., New York, acquired property of United Cork Co. plant and plans factory alterations, Grant and New York Aves., D. L. & W. R.R. tracks. To exceed $40,000 with equipment.

N. Y., Rochester—PLANT—Dolomite Marine Corp., 183 Main St., plans plant addition. $55,000.

N. Y., Syracuse—WAREHOUSE—Syracuse Supply Co., 314 West Fayette St., postponed until February or March, construction of warehouse, Erie Blvd. $40,000 or more. G. L. Noble, 313 Highland Av., archt. Noted Aug. 25, C.D.—Sept. 2. E.N.-R.

★**O., Gambrinus** — TUBE MILL — Timken Roller Bearing Co., 1835 Dueber Ave. S.W., Canton, plans constructing tube mill. To exceed $500,000. **Maturity in 1938.**

O., West Liberty—DEHYDRATING PLANT—Logan Co. Hydrators, Inc., c/o F. Craig, West Liberty, awards contract about May 1, constructing alfalfa meal dehydrating plant. $40,000.

Okla., Guymon—CARBON BLACK PLANT—B. H. Ashe, Guymon, applied for permit to construct carbon black plant, near here. **$100,000.**

Ore., Williams Creek — DEHYDRATING PLANT — Oregon Lime Products Co. soon takes bids new dehydrating plant. $40,000 incl equipment.

Pa., Lawrenceville—FURNACE BUILDING—McCullough-Dalzell Crucible Co. plans rebuilding 2 story furnace building destroyed by fire. $50,000 or more. Fire loss $100,000. Architect not appointed.

Pa., McAdoo — BAKING PLANT — International Baking Co., c/o M. Yankovich, McAdoo, plans baking plant. $45,000 or more with equipment.

Pa., Pittsburgh—MILL EXPANSION PROGRAM—Carnegie-Illinois Steel Corp., Carnegie Bldg., sketches for mill expansion program, incl. main office building, mill office, girls' welfare building, hospital and 20 locker and shower buildings. Rust Engineers, Clark Bldg., engrs.

Tex., Alice—PLANT—Duval Gas Co. made final plans 8 million cu. ft. capacity natural gasoline plant in Duval Co., near here. $100,000. Private plans.

Tex., Mercedes — CANNING PLANT — Rio Foods, c/o J. F. Drake, 1002 Indiana Ave., soon lets contract 1 story, 45x125 ft., rein.-con. and corrugated iron vegetable canning plant. Private plans.

★**Ont., Copper Cliff**—MILL—International Nickel Co., D. McCaskill, mgr., plans low grade mill unit adjoining present concentrator. $1,500,000. Private plans. Interested in prices complete equipment.

★**Ont., Whitney**—MINE—Hallnar Mines Ltd., c/o Noranda Mines Ltd., 2 King St E., Toronto, plans 400 ton per day mining plant in Porcupine area. $1,000,000. Engineer and architect not appointed.

BIDS ASKED

Calif., San Francisco—FACTORY—See "Contracts Awarded."

La., Minden—OIL REFINERY—See "Contracts Awarded."

Mass., Brighton (sta. Boston) — WAREHOUSE, etc.—S. E. Moffie, archt., 10 Tremont St., Boston, taking bids on separate contracts 1 story, basement, 70x202 ft., and 80x140 ft., brick, steel warehouse, hall and stores, concrete found., Commonwealth Ave., near Washington St., for Otto A. Theurer Contg. Co., Inc., 171 Watertown St., Watertown. Noted Dec. 3, C.D.—Dec. 9, E.N.-R.

CONTRACTS AWARDED

Calif., Los Angeles — FACTORY, etc. — Western Shade Co., 3700 West Washington Blvd., 1 and 2 story, 150x250 ft., rein.-con., structural steel factory and warehouse, sprinkler system, steam heating, electric elevator, Sunrise and Clarence Sts., to Escherich Bros., 234 West 37th St. Est. **$110,000.** Awarded about Dec. 14. W. L. Risley, 220 South Westmoreland St., archt.

Calif., Oakland—WAREHOUSE—H. J. Brunnier, engr., Sharon Bldg., San Francisco, 1 and part 2 story, structural steel warehouse, 180,000 sq. ft. floor space, sprinkler system, for Owens-Illinois Pacific Coast Co., 1855 Folsom St., San Francisco, Fruitvale Ave. and The Estuary, to P. J. Walker Co., Sharon Bldg., San Francisco, about **$300,000.** Est. $200,000 or more. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

Calif., San Francisco — SUPER-SERVICE STATION — Standard Oil Co. of California, 225 Bush St., steel frame super-service station, hydraulic jack, grease racks, etc., Market St. and Duboce Ave., to Barrett & Hilp, 918 Harrison St., **$40,000,** incl. grading. Noted Sept. 30, C.D.—Oct. 7, E.N.-R.

Calif., San Francisco—WAREHOUSE, etc.—Braun-Knecht-Heinmann Co., 584 Mission St., part 1 and 2 story, 148x400 ft., concrete warehouse and office, on block bounded by 15th, 16th, Carolina and DeHaro Sts., to Cahill Bros., 206 Sansome St., **$150,750.**

Calif., San Francisco — SUPER-SERVICE STATIONS—Union Oil Co. of California, Mills Tower, constructing auto service station at 3rd and Bryand Sts. and another at California and Scott Sts., featuring hydraulic jacks, pumps, gasoline tanks, etc. (all to be furnished by owner), to F. J. Early, 369 Pine St., to exceed **$40,000.**

Calif., San Francisco — SUPER-SERVICE STATION—Del Norte Investment Co., 25 Sutler St., constructing steel auto service station, 19th Ave. and Noriega Sts., to F. J. Early, 369 Pine St.

Calif., San Francisco—FACTORY—O. R. Schrader, et al, 1247 Harrison St., 1 story, concrete factory, 7th St., near Brannan St., day labor. Est. **$40,000.** Private plans.

Colo., Pueblo — PLANT — Walter Brewing Co., M. Walter, Jr., pres., brick, concrete steel bottling plant enlargement. **$225,000.** Owner builds. Private plans.

Conn., Bridgeport—GARAGE, etc.—E. and F. Constr. Co., general contractors, 94 Wells St., furnishing 200 tons structural steel for garage and shop, to American Bridge Co., (subsidiary U. S. Steel Corp.), Frick Bldg., Pittsburgh, Pa., for Southern New England Telephone Co., 157 Church St., New Haven. Noted Nov. 24, C.D.—Dec. 2, E.N.-R., under "Contracts Awarded."

Ia., Fort Dodge — WAREHOUSE — Stacy Fruit Co., general contract 1 story, brick warehouse, to M. J. Grosz, Fort Dodge. Est. **$70,000.** Noted Dec. 16, C.D. — Dec. 23, E.N.-R.

La., Minden — OIL REFINERY — Premier Oil & Refining Co., constructing 3,000 bbl. oil refinery near here, in Webster Parish, force account, **$75,000.** L. G. Duffillio, Longview, Tex., engr.

Md., Baltimore—MARKET—P.I.C. Realty Co., G. Farbar, agent, Federal Bldg., 1 story, 60x250 ft., brick, steel frame market, 2140 North Fulton Ave., to B. Dincoff, 3810 Sequoia Ave. Est. **$40,000.** D. Harrison, 421 St. Paul Pl., archt.

Md., Baltimore — WAREHOUSE—American Stores Co., 2120 West Lafayette Ave., 1 story, 130x140 ft., rein.-con. warehouse, 1001 North Smalwood St., to Consolidated Eng. Co., 20 East Franklin St. Est. **$50,000.** Private plans.

Mass., Fall River—WAREHOUSE—E. J. Cox Paper Co., 111 Harrison St., 1 story, basement, brick, steel warehouse addition, concrete found., Harrison St., to James T. Sampson & Sons, 280 New Boston Rd., Fall River. Est. exceeds **$40,000.** Private plans. Awarded recently.

Mass., South Boston (sta. Boston)—WAREHOUSE—Westinghouse Electric Co., 10 High St., Boston, sprinklers for warehouse, Old Colony Blvd. and Dorchester Ave., to Rockwood Sprinkler Co., 141 Milk St., Boston. Noted Dec. 9, C.D.—Dec. 16, E.N.-R., under "Contracts Awarded."

Mich., Adrian—LIGHT PLANT DIESEL ENGINES—Southeastern Michigan Electric Co., Blissfield, furnishing, installing 2 diesel engines, outside transformers, switchboard equipment, traveling crane for light plant, to Fairbanks-Morse Co., 900 South Wabash Ave., Chicago, Ill., **$79,401.** Total est. $130,000, incl. plant. Soon takes bids for 1 and 2 story, part basement, 40x90 ft., brick plant. R. A. White, Adrian, engr. Noted Nov. 16, C.D.—Nov. 2, E.N.-R.

Miss., Union—COMPRESS—Union High Density Compress Co. constructing compress, to S. Hays, Union. Est. **$45,000.**

Neb., Omaha — WAREHOUSE — Nebraska Consolidated Mills Co., 1521 North 16th St., constructing warehouse, to Parsons Constr. Co., 701 North 20th St., about **$45,000.** Bids Dec. 8. Noted Nov. 17, C.D. — Nov. 25 E.N.-R.

N. J., Atlantic City—BOTTLING PLANT—A. P. Miller, general contractor, 333 Arctic Ave., 160 tons structural steel for bottling plant for Coco Cola Bottling Co., East Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa. Noted Nov. 17, C.D.—Nov. 25, E.N.-R., under "Contracts Awarded."

N. Y., Ithaca — FACTORY — Ithaca Enterprises, Inc., A. N. Gibb, East State St., Ithaca, general contract factory, Hudson St., to J. Dall, Jr., Inc., Seneca Bldg.***plumbing, to Donahue & Halverson, 207 North Aurora St.***electrical work to Norton Electric Co., 211 East Seneca St.***heating, to Jameson & McKinney, 121 South Cayuga St. Est. **$40,000.** General contractor awarded structural steel, to Seneca Eng. Co., Montour Falls. Bids Nov. 1. Noted Oct. 28, C.D.—Nov. 4, E.N.-R.

N. Y., New York—FACTORY, etc.—Owner, c/o C. F. Noyes & Co., Inc., 225 Bway., altering factory and storage, 400-406 Bway., to A. J. Courtmel & Co., Inc., 512 5th Ave. Est. **$40,000.** Carol Textile Corp., 84 Eldridge St., New York, lessee.

Okla., Oklahoma City—OIL REFINERY—Travis Petroleum Co., 416 North Eastern St., constructing new pressure oil refining plant for Travis Petroleum Co., to H. V. Kirkpatrick, 2221 Northeast 10th St., Oklahoma City, **$25,000.** Awarded Dec. 10.

Pa., Pittsburgh—MANUFACTURING and DISTRIBUTING PLANT—Coca Cola Co., 310 North Ave., N.W., Atlanta, Ga. and Lancaster St. and Grays Ave., Wilmington, Del., 2 story, basement, brick, steel, stone trim manufacturing and distribution building, Negley St., to Hughes-Foulkrod Co., Koppers Bldg. Bids Dec. 14, awarded Dec. 17. Noted Dec. 7, C.D.—Dec. 9, E.N.-R.

Pa., Phila.—PLANT—Singer Sewing Machine Co., 928 Chestnut St., 3 story plant, 112 North 12th St., to Turner Constr. Co., Architects Bldg. Est. exceeds **$50,000.** Bids Oct. 11. Noted Sept. 30, C.D.—Oct. 7, E.N.-R.

R. I., Providence—PLANT—Rowley Constr. Co., general contractors, 260 Central Ave., Pawtucket, electrical work for 1 story, 160x185 ft., brick, steel, bottling plant, West Park Ave., to New England Machine & Electric Co., 77 Bayley St., Pawtucket, for Coca Cola Bottling Co. of Rhode Island, 477 Smith St.***heating, to Lincoln & Lane Co., 30 Bayley Ave., Pawtucket***plumbing, to T. R. Douglas, 100 Eldridge St., Auburn***structural steel, to James H. Tower Iron Wks., 50 Borden St., Providence***reinforcing steel, to Truscon Steel Co., 87 Weybosset St., Providence***sprinklers to Grinnell Co., Inc., 260 West Exchange St., Providence. Noted Dec. 13, C.D.—Dec. 16, E.N.-R., under "Contracts Awarded."

Ont., Hamilton — FACTORY — Consolidated Sales Book & Wax Paper Co., 800 Burlington St., E. L. M. Appleford, genl. mgr., constructing 1 story factory, 101x175 ft., with 25x55 ft. and 15x35 ft. wings brick, steel, incl. sprinkler system, Burlington St., to Cooper Constr. Co., Medical Arts Bldg. Est. **$100,000.** Noted Dec. 2, C.D.—Dec. 9, E.N.-R.

Ont., Red Rock—PLANT—A. Fleck, Ltd., general contractors, 416 Wellington St., Ottawa, electric wiring for bleaching plant for Lake Sulphide Pulp Co. Ltd., c/o R. O. Sweezey & Co. Ltd., 210 St. James St. W., Montreal, Que., to Canadian Comstock Co. Ltd., 620 Cathcart St., Montreal, Que. J. Stadler, 1117 St. Catherine St. W., Montreal, Que., engr. Noted Nov. 23, C.D.—Dec. 2, E.N.-R., under "Contracts Awarded."

Ont., Sudbury—MILL—Bilmac Gold Mines, 33 Temperance St., Toronto, constructing 75 ton per day mining plant, at West Shining near here, to Canadian Allis Chalmers Ltd., 212 King St. W., Toronto. Noted Dec. 10, C.D.—Dec. 16, E.N.-R.

Ont., Waterloo—BREWERY—Carling Kuntz Breweries Ltd., 155 King St. S., general contract 1 story, brick addition to form refrigerator unit, plain found., King St. S., to Dunker Constr. Co. Ltd., 251 King St., Kitchener. **$65,000.** Bids Dec. 8. Noted Dec. 3, C.D.

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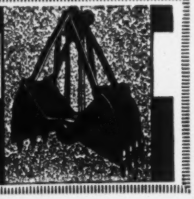

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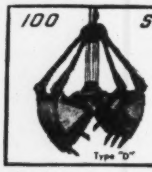

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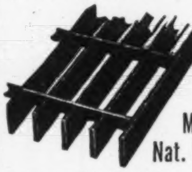

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OFFICIAL PROPOSALS

COPY:
5 P.M. Tuesday for next issue

Official notices of bids wanted on construction and related work, equipment and material for government, state, municipal departments and private enterprises.

Bids: January 10. (753)

Dishwashers and Refrigerators

SCHOOL DISTRICT OF PHILADELPHIA
THE BOARD OF PUBLIC EDUCATION
PARKWAY AT TWENTY-FIRST STREET

Sealed proposals addressed to the Committee on Property of the Board of Public Education will be received at the office of the Secretary and Business Manager, Administration Building, 21st and Parkway, until 2 P. M. (Eastern Standard Time), January 10, 1938, and will be publicly opened and read at the Administration Building at that time, for
ISHWASHERS AND REFRIGERATORS
for the
Academic High School, Ogontz and Olney Avenues; Senior High School, 67th Street north of Elmwood Avenue.

Plans and contract documents may be examined and copies thereof obtained from the Department of Buildings of the Board of Public Education, 9th Floor of the Administration Building, 21st at Parkway, upon deposit of $10 for each set. If the plans and specifications are returned in good condition within five days after the opening of the bids the full amount of the deposit will be refunded. If the documents are not returned within the time stated, the entire amount of the deposit will be forfeited.

The Board of Public Education shall have the right to reject any and all bids and make the awards to the best interests of the School District of Philadelphia.

The minimum wage rates permissible on this project shall be in accordance with the minimum rates in the specifications.

Attention of the bidders is particularly called to the conditions of employment to be observed.

No bidder may withdraw his bid for a period of sixty days after the date set forth for the opening thereof.

Every bidder must be prepared to submit a sworn financial statement and a performance record immediately after the bids have been opened.

The successful bidder will be liable to the Board of Public Education in liquidated damages in the event that the contract is not completed on or before the completion date.

The character and amount of bid security to be furnished by bidders is stated in the Standard Conditions.

ADD B. ANDERSON,
Secretary and Business Manager.

U. S. ENGINEER OFFICE, 3rd Foor, Park Square Bldg., Boston, Mass.—Sealed bids will be received here until 11:00 A. M., E. S. T., January 20, 1938, and then opened for furnishing all labor and material and performing all work for *dredging* approximately 617,200 cu. yds., place measurement, of material between stations 70+00 and 110+00 in Cape Cod Canal, Mass. Further information upon application. (745)

U. S. ENGINEER OFFICE, 1068 Navy Building, Washington, D. C. Sealed proposals will be received here until 3 P. M., January 11, 1938, and then opened, for *furnishing two sanitary sewage pumping or ejector units at the Naval Air Station, Anacostia, Washington, D. C.* (752)

TENNESSEE VALLEY AUTHORITY, KNOXVILLE, TENNESSEE. Sealed bids, in duplicate, will be received until 10 A. M., Central Standard Time, January 12, 1938, and then publicly opened, for ***services in connection with Dusting Operations with Mosquito Larvicides for Malaria Control in the Reservoirs*** and any other Area designated by the Authority, including the furnishing of all Airplanes and Airplane Pilots and Mechanics, labor, tools, equipment, fuel and supplies for the operation, maintenance and servicing of the Airplanes. Bidding documents, for which there is no charge, available December 23, 1937, at above office. C. H. Garity, Director of Purchases. (750)

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The Dominant Proposal Medium

ENR-031P

Bids: January 4 (733)

Intercepting Sewer

Sealed proposals for the construction of the Front Street Intercepting Sewer for the City of Memphis, Tennessee, P.W.A. Docket No. Tenn. 1262-DS, Contract Section II, will be received by the City Commission of the City of Memphis, Tennessee, at the office of D. C. Miller, City Comptroller, Room 204 Court House, until 2:30 P.M., on the 4th day of January, 1938, and will be opened immediately and read publicly.

Copies of the proposal, contract documents, drawing and specifications may be obtained from the office of Wm. B. Fowler, City Engineer, Room 119 Court House. A charge or deposit of Twenty ($20.00) Dollars will be required of eligible bidders for procuring plans and specifications. The deposit for plans and specifications will be returned to all, except the successful bidder, on the return of the plans, contract documents and specifications in good condition. A set of plans and specifications may be examined free of charge at the office of the Consulting Engineers, Black & Veatch, of Kansas City, Missouri, or at the office of the City Engineer.

Each bid must be accompanied by a certified check or cashier's check on a solvent bank, or a bidder's bond executed by the bidder and a Surety Company licensed to do business in Tennessee in the sum of 5% of the amount of the bid. The bond is required as a guarantee that if the bid is accepted, a contract will be immediately entered into and the performance of it properly secured. The successful bidder will be required to execute a Performance Bond in the amount of 100% of the contract price.

Proposal Form must be properly filled out and must not be detached from specifications. No qualifying letters or statements will be considered.

All bidders must be licensed contractors as required by Chapter 70 of the Public Acts of 1931 of the General Assembly of the State of Tennessee. Bidder's name and license number must be placed on the envelope containing these documents.

WAGES: Attention is called to the fact that no less than the minimum wage rates as set up in the specifications must be paid on this project, as prescribed by the City of Memphis, Tennessee.

WITHDRAWAL OF BIDS: Unless contrary to statutes of the State of Tennessee, including local charter provisions, no bidder may withdraw a bid submitted for a period of thirty days after the date set for the opening of such bid.

The estimated construction cost is $418,786.85.

Award will be made on the lowest and best bid, if awarded.

All work must be completed in a manner satisfactory to the City Engineer.

The City reserves the right to reject any or all bids and to waive informalities in bids.

Any bid received after the scheduled closing time for receipt of bids shall be returned to the bidder unopened.

This Contract Section is located on Front Street from Poplar Avenue on the North to McCall Place on the South and involves the construction of approximately 3,563 lineal feet of concrete sewer, 7 feet 10 inches internal height, in tunnel under compressed air, together with four intercepting structures for connections to existing sewers and such other appurtenances, and work as is set out in the plans, specifications, proposal forms and contract documents.

WATKINS OVERTON, MAYOR
ATTEST:
D. C. MILLER, CITY COMPTROLLER.

Bids: January 4 (732)

Construction Work

Dated December 15, 1937

Board of Education of Union Free School District No. 3, Town of Huntington, Suffolk County, New York

Sealed bids for General Construction, Heating and Ventilating, Plumbing and Electrical Work for Junior High School Building, Huntington, New York, will be received by the Board of Education of Town of Huntington, N. Y. at the office of the Board in High School Building, East Main Street, Huntington, N. Y. until 2 o'clock P. M. Tuesday, January 4, 1938, and then at said office publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Forms of Bid Bond and Performance Bond may be examined at the office of TOOKER & MARSH, Architects, 101 Park Avenue, New York, N. Y. on and after December 15, 1937, and copies thereof obtained upon deposit of a properly certified check made payable to the Architects, in the amount of Fifty Dollars ($50.00) for each set. Any bidder, upon returning such set in good condition to the Architects within ten (10) days after the date of the opening of bids will be refunded his deposit. Non-bidders will be refunded Twenty-five Dollars ($25.00).

Only one complete set of plans and specifications will be sent each prospective bidder, by American Railway Express "Collect" as soon as requested.

The Board of Education reserves the right to waive any informalities in or to reject any or all bids.

Each bidder must deposit with his bid security in an amount of not less than five percentum (5%) of the base bid in the form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under the contract.

The estimated cost of the work to be performed under this contract is:

General Construction......	$448,200.00
Heating and Ventilating..	68,400.00
Plumbing	34,200.00
Electrical Work	34,200.00
	$585,000.00

No bidder may withdraw his bid within 45 days after the actual date of the opening thereof.

The Contract will be financed in whole or in part by the Federal Emergency Administration of Public Works.

By Order of the Board of Education
George D. McKay
Clerk

December 15, 1937

Bids: January 10 (734)

State Highway Work

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

L.V.R.R. BRIDGE
ROUTE 35 EXT., SEC. 12

Construction of a bridge to carry the tracks of the Lehigh Valley Railroad across Route 35 Extension, Section 12, in Woodbridge Township, Middlesex County. The project consists of a three track railroad bridge of two spans of steel and concrete, having an overall length of about 80 feet. The principal items of construction are:

Estimated:
10,730 cu. yds. Roadway excavation
851 cu. yds. foundation excavation
1,450 cu. yds. concrete
293,000 lbs. structural steel
65,650 lbs. reinforcement steel

Bids for the above will be received at the office of the State Highway Department, State House Annex, Trenton, N.J., on Monday, January 10, 1938, at twelve o'clock Noon, Eastern Standard Time, and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must submit a revised financial statement and statement of plan and equipment with their bid.

NOTE: The proposed work is a "Regular Federal Aid Project" under the provisions of Section 4 of the Federal Act of June 18, 1934 (H. R. 8781) known as the Hayden-Cartwright Act, and is to be performed in accordance with the Special Provisions and Requirements of the United States Department of Agriculture, Bureau of Public Roads, as outlined in the Supplementary Specifications to be made a part of the contract and specifications, which provisions require that labor be employed from lists furnished by the State Employment Service, 198 Jefferson Street, Perth Amboy, N.J. The attention of bidders is directed to the Special Provisions covering subletting or assigning the contract and to the use of Domestic Materials. The minimum wage paid to all unskilled labor employed on this contract shall be [illegible] per hour. The minimum wage paid to all intermediate grade of labor employed on this contract shall be 65c per hour. The minimum wage paid to all skilled labor employed on this contract shall be [illegible] per hour.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N.J. and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 102, State House Annex, Trenton, N.J. Bids must be made on the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten per cent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

U. S. Government

U. S. DEPARTMENT OF AGRICULTURE, Bureau of Public Roads, Washington, D. C. December 15, 1937. SEALED BIDS will be received at the office of the Bureau of Public Roads, 1725 F Street, N.W., Washington, D.C., until 11 o'clock a.m., E.S.T., January 20, 1938, for the *construction of 1.26 miles of road including reinforced concrete structure with stone facing, Project 2D3, Blue Ridge Parkway, Alleghany and Ashe Counties, North Carolina.* The approximate quantities of the more important items are as follows: [illegible]900 cu.yd. excavation; 380 cu.yd. cement concrete; 28,600 lb. reinforcing steel; 1,530 cu.yd. stone and rubble masonry; 80 cu.yd. dimensioned masonry; and [illegible] sq.yd. rock paved gutter. Minimum rates of wages which must be paid laborers and mechanics on this project have been fixed by the Secretary of Labor as required by law. Where plans and specifications are requested, a deposit of $10.00 certified check or cash, will be required to insure their return within 15 days after opening of bids. Checks must be made payable to the Treasurer of the United States. Plans, specifications and proposal forms may be obtained at the office of the Bureau of Public Roads, 1725 F Street, N.W., Washington, D.C., or Shendoah Life Insurance Building, Roanoke, Virginia, H. J. Spelman, District Engineer. (736)

PROCUREMENT DIVISION, Public Buildings Branch, Washington, D. C., Dec. 14, 1937.—Sealed proposals in duplicate will be publicly opened in this office at 1 P. M., Jan. 19, 1938, for *construction of the U. S. P. O., at Carmi, Ill.* Upon application, one set of drawings and specifications will be supplied free to each general contractor interested in submitting a proposal. The above drawings and specifications MUST be returned to this office. Contractors requiring additional sets may obtain them by purchase from this office at a cost of $5 per set, which will not be returned. Checks offered as payment for drawings and specifications must be made payable to the order of the Treasurer, U. S. Drawings and specifications will not be furnished to contractors who have consistently failed to submit proposals. One set upon request, and when considered in the interests of the Government, will be furnished, in the discretion of the Assistant Director, to builders' exchanges, chambers of commerce or other organizations who will guarantee to make them available for any sub-contractor or material firm interested, and to quantity surveyors, but this privilege will be withdrawn if the sets are not returned after they have accomplished their purpose. W. E. Reynolds, Assistant Director of Procurement, Public Buildings Branch. (730)

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C. G. WIGLEY
Manufacturers Agent
3108 ATLANTIC AVE., ATLANTIC CITY, N. J.

U. S. Government

SEALED BIDS will be received at the U. S. Engineer Office, 932 U. S. Post Office Building, Canal and Van Buren Streets, Chicago, Illinois, until 10:00 A. M., C. S. T., January 6, 1938, and then publicly opened, for furnishing all labor and materials and performing all work for the hire and operating of one dipper dredge and attendant plant, with crew, for *dredging* in the Illinois Waterway, Illinois, between Lockport Lock and Starved Rock Lock and Dam, for not more than 510 working days of eight hours each nor less than 340. Further information upon application. (715)

U. S. ENGINEER OFFICE, Nashville, Tenn.—Sealed bids will be received at this office until 11:00 A. M. (C. S. T.) January 18, 1938, and then publicly opened, for *constructing a canal and levees and appurtenant works at Middlesboro, Kentucky.* The work will be divided into four sections on which bids will be received separately. Further information on application. (731)

WAR DEPARTMENT, Office of the Construction Quartermaster, Sacramento, Air Depot, California. Sealed proposals will be received at this office until 2:00 P. M., P. S. T., January 28, 1938, and then publicly opened, for the *construction and completion of an Air Corps Gasoline Fueling System at Sacramento Air Depot, Sacramento, California.* Plans and specifications may be obtained at the above office by deposit of a certified check in the amount of $5.00 made payable to the Treasurer of the United States. (737)

OFFICIAL PROPOSALS

Bids: January 4. (722)

State Highway Work

STATE DEPARTMENT OF PUBLIC WORKS, DIVISION OF HIGHWAYS
ALBANY, N. Y.

Sealed proposals will be received by the undersigned at the State Office Building, 13th Floor, Albany, N. Y., until one o'clock P. M. on Tuesday, JANUARY 4, 1938, for the construction and reconstruction of highways in the following counties:

CONSTRUCTION

County	Deposit Required	Type	Mile
Dutchess	$6,000.00	Preliminary Grading and Structures	4.70
Erie	19,000.00	62′ Steel Beam Elim. Structure over W. S. RR. Bit. Mac. MM. type 3 Appr	0.45
Saratoga	7,000.00	18′ Bottom Course; B. M. Pen. Method	5.69
Westchester	5,000.00	20′ Bottom Course; B. M. Pen. Method	2.43

RECONSTRUCTION

County	Deposit Required	Type	Mile
Clinton	20,000.00	Concrete	7.34
Montgomery	2,500.00	60′ Plate Girder; Concrete and Bit. Mac. MM. Opt. Appr	0.06
Tioga	21,000.00	22′ Concrete 8″ including 3 span I-Beam Bridge; 2-46′ and one 65′ span	3.86

Maps, plans, specifications, and estimate of cost may be seen and proposal forms obtained at the office of the Division of Highways in Albany, N. Y., and at the office of the District Engineers in whose districts the roads are located, upon the payment of Five Dollars ($5.00) for plans and proposal forms. Standard specifications are Two Dollars ($2.00) per copy. No refund will be made on plans, specifications, or proposal forms. Plans and proposal forms may be seen at the office of the State Department of Public Works, State Office Bldg., Worth and Center Streets, New York City. The addresses of the District Engineers and Counties in each district will be furnished upon request.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specifications, and contract agreement. The attention of bidders is also directed to the special provisions applying to projects financed with federal funds.

Proposal for each highway or contract must be submitted in a separate sealed envelope with the name and number of the highway plainly endorsed on the outside of the envelope. Each proposal must be accompanied by cash, draft or certified check, payable to the order of the New York State Department of Public Works, Division of Highways, for the sum as specified in the advertisement for proposals and the proposal itself for each project. The retention and disposal of such cash, draft or check by the State Division of Highways shall conform with Sub. 2, Sec. 38 of the Highway Law, as amended. The successful bidder will be required to execute the contract and comply in all respects with Sec. 38 of the Highway Law, as amended. The amount of the certified check accompanying the proposal of the bidder to whom the contract is awarded will be returned when ten per-centum of the work under the contract has been completed. If Surety Bond is dispensed with, in pursuance to the Highway Law, the amount of the bidding check will be returned when fifteen per-centum of the contract work has been completed.

On contracts with federal funds, when optional types are permitted for any one item of work, contractors must state in the space provided in the proposal for this purpose the exact designation of the optional type upon which the proposal is predicated. No one proposal shall contain more than one bid for an optional item. The award, if made, will be on the basis of the responsible proposal which for all items of work gives the lowest total cost for the project and the contract will call for the type designated in such proposal.

Skilled, Intermediate Grade, and Unskilled Labor on all projects shall receive the minimum wage rate per hour as follows: In New York City: Skilled Labor, eighty cents per hour; Intermediate Grade Labor, seventy cents per hour; Unskilled Labor, seventy cents per hour; in the Counties of Nassau, Suffolk and Westchester: Skilled Labor, seventy-five cents per hour; Intermediate Grade Labor, sixty-five cents per hour; Unskilled Labor, sixty-five cents per hour; in the Counties of Dutchess,* Ulster, Orange & Sullivan, seventy-five cents per hour for Skilled Labor; Intermediate Grade Labor, Fifty-five cents per hour; Unskilled Labor, fifty cents per hour with the exception of Orange County which rate is sixty cents per hour; and in all other counties other than above, Skilled Labor, seventy-five cents per hour; Intermediate Grade Labor, fifty-five cents per hour; Unskilled Labor, Forty-five cents per hour, unless shown otherwise in the itemized proposal.

The minimum hourly rate of wages for the various types of operations and trades, as well as the hours of work and conditions of employment, shall be set forth under the Special Provisions in the itemized proposal for each project.

In conformity with the provisions of Section 220, Sub-division d, of the State Labor Law, as amended, the minimum hourly rate of wages has been established and is annexed to and forms a part of the specifications for the project, and may be ascertained upon reference to the proposal for the project itself.

The right is reserved to reject any or all bids.

FRED'K STUART GREENE
SUPT. STATE DEPT. PUBLIC WORKS

Bids: January 12. (729)

State Highway Work

Sealed proposals will be received by the State Highway Department, at its office, Dover, Del., until 2:00 o'clock, p. m., Eastern Standard Time, January 12, 1938, and at that time and place publicly opened for contracts involving the following approximate quantities:

CONTRACT 155-B
Ornamental Lights, Silver Lake Bridge
4 Ornamental Lights for Silver Lake Bridge, Lump Sum
CONTRACT D-2
500 Watt Radio Station at State Road
1 500 Watt Radio Station completely installed at State Road
1 Removal of Present Radio Station at State Road and Installing same at Dover, Del.

Performance of contract shall commence within ten (10) days after execution of the contract and be completed as specified.

Monthly payments will be made for 90 per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by a surety bond, certified check, or money to the amount of at least ten (10) per centum of the total amount of the proposal.

The envelope containing the proposal must be marked "Proposal for the construction of State Highway Contract No. ...."

The contract will be awarded or rejected within twenty (20) days from the date of opening proposals.

The right is reserved to reject any or all bids.

Complete sets of plans and specifications may be obtained after December 27, 1937, upon receipt of two dollars ($2.00) for each contract, which amount will not be refunded.

STATE HIGHWAY DEPARTMENT
Dover, Delaware

Now and always a wise contractor will establish relations with a strong bank and a strong surety.
ÆTNA CASUALTY & SURETY COMPANY
Hartford, Conn.
CONTRACT BONDS FOR RESPONSIBLE CONTRACTORS
Agents Everywhere

Bids: January 14. (748)

Track Material

Sealed proposals will be received by The Central Railroad Company of New Jersey at the office of the Chief Engineer, Jersey City Terminal, Jersey City, N. J., until 1:00 P. M., Eastern Standard Time, Friday, January 14, 1938 for furnishing 41 switches, 49 frogs, 128 guard rails, 280 insulated joints; 52 compromise joints, 15 crossings and slip crossings, and 4 derails, all in connection with Elizabethport Grade Crossing Elimination, Elizabeth, N. J., and will be publicly opened and read at that time.

Form of Proposal, Specifications, Plans and Contract Form may be examined at the office of the Chief Engineer, and one copy thereof may be obtained by each bidder upon deposit of the sum of Twenty-Five ($25.00) Dollars.

All Contract documents and plans must be returned. If a formal proposal has been submitted by the bidder, the deposit will be refunded upon the return of the documents and plans in good condition within 30 days after the opening of the bids. If a formal proposal is not submitted, the actual cost of reproducing the documents will be deducted from the deposit.

Proposals should be enclosed in opaque sealed envelopes, addressed to the undersigned, and plainly marked on the outside "Proposal for switches, frogs, guard rails, joints, crossings, derails, etc., Elizabethport, N. J.", and name of the bidder.

Bidders are not required to quote on all items but may quote on one or more or all items.

Each bid must be accompanied by a certified check in an amount of not less than Ten Per Cent of the bid, drawn upon an incorporated bank or trust company, payable to The Central Railroad Company of New Jersey, as a guarantee that in case the contract is awarded to the bidder, he will, within two weeks thereafter, execute such contract. Upon failure so to do he shall forfeit the deposit as liquidated damages and the acceptance of the bid will be contingent upon the fulfillment of this requirement by the bidder. The checks of all, excepting the three lowest bidders will be returned within three days after the opening of bids, and the remaining checks will be returned when the contract is completely executed. No interest will be allowed upon any such certified check.

No bidder may withdraw his bid for a period of 30 days after the date set for the opening thereof.

The project for which this material is required is financed in whole or in part by the Federal Emergency Administration of Public Works.

In determining the lowest responsible bidder, the following elements shall be considered: Whether the bidder involved (a) maintains a permanent place of business; (b) has adequate plant equipment to furnish the material properly and expeditiously; (c) has suitable financial status to meet obligations incident to the furnishing of the material; (d) has appropriate technical experience; and (e) is regularly engaged in furnishing material of similar character and quantity.

The Central Railroad Company of New Jersey reserves the unqualified right, in its sole and absolute discretion, to reject any or all bids, and/or to accept the bid that in its judgment will be for the best interests of the State of New Jersey and the Railroad Company.

By order of The Central Railroad Company of New Jersey.

A. E. OWEN
Chief Engineer
C. R. R. Co. of N. J.
Jersey City, New Jersey.

Bids: January 14. (747)

Refuse Incinerator

Sealed proposals are invited for the construction complete of a REFUSE INCINERATOR for the TOWN OF GREENWICH, Connecticut, to be received by the Selectmen at the Town Hall until 3:00 o'clock P. M. Friday, January 14th, 1938, at which place and time they will be publicly opened and read aloud. Capacity 150 tons in 24 hours; back-in, storage-bin, crane-feed type.

Plans, specifications and proposed Contract Documents may be examined at the office of S. E. Minor & Co., Inc., Engineers, Smith Building, Greenwich, and sets obtained upon deposit of $30.00, fully refundable to bidders returning sets in good condition, one-half refundable to non-bidders, within 30 days after the opening.

Proposals shall be made on form provided, and be accompanied by bid security, either a certified check or a bid bond from an acceptable surety, in the amount of $10,000.00. A Performance Bond by an acceptable surety will be required in the amount of one hundred (100) per cent of the contract and in the form prescribed. All proposals shall stand subject to acceptance for a period of thirty (30) days after the opening, and the right is reserved to waive any informalities in, or to reject any or all bids.

Only incinerators by recognized manufacturers, of a like nature and size, or larger, in successful operation in the United States for a period of at least two (2) years will be considered.

This is identified as PWA Project No. Conn. 1278-DS. and there is estimated to be available for the subject contract the approximate sum of $165,000.00.

Signed Eugene S. Loughlin
First Selectman

Greenwich, Conn.
Dec. 21, 1937.

Bids: January 18. (749)

Bridge Construction

CITY OF TOLEDO, OHIO
DEPARTMENT OF PUBLIC SERVICE
DIVISION OF BRIDGES

Sealed proposals will be received at the office of the Commissioner of Purchases and Supplies, Room 324, Safety Building, Toledo, Ohio, until 2:00 O'Clock P. M., Tuesday, January 18, 1938, for the reconstruction of the Fassett Street Bridge over the Maumee River between Piers No. 4 and 6.

The work to be performed includes the rebuilding of Pier No. 4 above the water line, complete construction of 2 new piers including cofferdams, reconstruction and strengthening of pier No. 6. Approximately 900 cubic yards of concrete. The construction of 3 new spans of continuous deck truss, except decking. Approximately 300 tons of steel.

Proposal forms, plans, specifications, etc., may be obtained at the office of the Commissioner of Purchases and Supplies upon deposit of $10.00 which will be refunded to actual bidders only, provided plans are returned in good order within 1 week after date set for receiving proposals. All bids must be made on the Proposal Form.

A bidder's bond, certified or cashier's check on a solvent bank, payable to the City of Toledo, in the amount of 5% of the total amount of the bid, as a guarantee that if the proposal is accepted, a contract will be entered into, is to accompany the bid.

The successful bidder will be required to give bond, in an amount not less than the estimated total contract price contained in his proposal, as security for the faithful performance of the contract.

The City Manager reserves the right to reject any and all bids, or to accept that proposal which will best serve the interests of the City of Toledo.

CITY OF TOLEDO,
(Signed) John N. Edy,
City Manager.
Geo. N. Schoonmaker,
Director of Public Service.

Bids: January 11. (744)

Construction Work

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL
NORTH TUBE
CONTRACT MHT-54
NEW YORK APPROACH BORINGS

Sealed proposals for the above work in connection with the New York approach to the north tube of the Lincoln Tunnel will be received at the office of the General Manager of The Port of New York Authority, Number 111 Eighth Avenue, Borough of Manhattan, New York City, until 10:30 Eastern Standard Time, on the morning of Tuesday, January 11, 1938, and thereafter in the Auditorium in the office of the Port Authority at the same address until 11:00 A. M., on the same date, at which latter time and place said proposals will be publicly opened and read aloud.

A more complete description of the work and full information for bidders is given in the contract papers which may be seen at the office of the Assistant Chief Engineer, The Port of New York Authority, Room 1537, 111 Eighth Avenue, New York City.

Complete copies of the foregoing papers will be furnished upon deposit of $10.00 per set. The deposit will be remitted if the papers are returned in good condition, not later than sixty days after the opening of proposals.

The Port Authority reserves the right to waive any informalities in or to reject any or all proposals.

Each proposal must be accompanied by a certified check in the amount of $100.00, or by a bid bond in like amount.

The construction of the project to which this contract relates is being financed in part by the Federal Emergency Administration of Public Works.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under the contract.

No bidder may withdraw his proposal within 60 days after the date set for the opening thereof.

THE PORT OF NEW YORK AUTHORITY
Frank C. Ferguson, Chairman

Bids: January 20. (751)

Construction Work

ADMINISTRATION AND
HOSPITAL BUILDING, ETC.
AUBURN PRISON
AUBURN, N. Y.
Spec. Nos. 9581, 9582, 9583, 9584,
9585 and 9586.

Separate sealed proposals covering Construction, Heating, Sanitary and Electric Work, Special Electric Fixtures and Electric Elevators for Administration and Hospital Building and Auditorium and Chapel, Auburn Prison, Auburn, N. Y., in accordance with Specifications Nos. 9581, 9582, 9583, 9584, 9585 and 9586 and accompanying drawings, will be received by the Commissioner of Correction, State Office Building, Albany, N. Y., until 2:30 o'clock P. M. (Eastern Standard Time) on Thursday, January 20, 1938, when they will be publicly opened and read. This date shall supersede the date previously advertised. The approximate amount of this project is $800,000.00.

Proposals shall be accompanied by a certified check or money deposit of 5% of the amount of the bid. Successful bidders will be required to give a bond in the sum of 100% of the amount of the contract on contracts in excess of $500.00, conditioned for the faithful performance of the contract. Corporations submitting proposals shall be authorized to do business in the State of New York. Drawings and specifications may be examined free of charge at the following offices:

Commissioner of Architecture, State Office Building, New York City.
Commissioner of Architecture, State Office Building, Albany, N. Y.
District Engineer, 109 N. Genesee St., Utica, N. Y.
District Engineer, Weighlock Bldg., Syracuse, N. Y.
District Engineer, Barge Canal Terminal, Rochester, N. Y.
District Engineer, 65 Court St., Buffalo, N. Y.
District Engineer, 71 Frederick St., Binghamton, N. Y.
Auburn Prison, Auburn, N. Y.

Drawings and specifications may be obtained from the Commissioner of Architecture, State Office Building, Albany, N. Y., upon payment for each set as follows: Construction, $30.00; Heating, $15.00; Sanitary, $15.00; Electric, $15.00; Electric Fixtures, $5.00, and Elevators, $5.00. Proposal blanks and envelopes will be furnished without charge.

Half of this payment will be returned if the drawings and specifications are returned in good condition to the Commissioner of Architecture, State Office Building, Albany, N. Y., within two weeks after date of opening bids.

Dated: 12/2/37.

Make Plans Accessible to Distant Bidders

Plans and specifications for inspection by distant bidders may be filed at any of *Engineering News-Record* offices (without charge). Or a sufficient supply may be deposited at such of our offices as seem desirable, subject to your usual requirements in the matter of deposits, etc. (We assume full responsibility for return of plans or deposits). Therefore, Contractors in all parts of the country can bid with equal convenience on contracts advertised in *Engineering News-Record*.

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CONSTRUCTION MAN—Executive and field. Broad experience; capable handling large construction from estimate to final payment. Available for any location. PW-201, Engineering News-Record, 520 No. Michigan Ave., Chicago, Ill.

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1050 **Lineal feet Concrete Slab Forms,** in 10' lengths, 9" high.
1—**Complete Double Cableway** (2 steel towers, each 70' high, overall width 24' 4", 65' long at base, towers mounted on 40 ton railroad trucks, capacity 135000#; 1 Ledgerwood 5 ton 2 drum elec. hoist; 800 ft. 1¾" lock coil cable, sheaves, block; 1 Mundy 5 ton 3 drum elec. hoist; 800 ft. 1¾" cable, sheaves, block.)
1—2 cu. yd. stationary **Concrete Mixer.**
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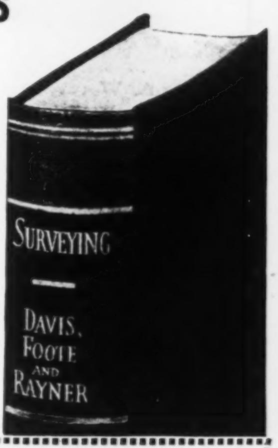

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